A N

A C C O U N T

O F T H E

Conſtant and Periodical Trade-Winds,

O R

M O N S O O N S,

T H E

L A N D and S E A B R E E Z E S,

A N D T H E

V A R I A B L E W I N D S;

T O G E T H E R W I T H

An Account of the Setting of the CURRENTS, and the Strength thereof,

As they moſt commonly happen in the different Parts of the EAST-INDIES.

THE WHOLE ILLUSTRATED BY

EXAMPLES taken from the JOURNALS of ſeveral EUROPEAN and COUNTRY SHIPS; ſhewing the Reaſon why ſome have made their Paſſages, whilſt others, in the ſame Seaſon, or perhaps at the very ſame Time, have loſt, or at leaſt prolonged theirs.

By P H I L O - N A U T I C U S.

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AN

ACCOUNT

OF THE

Conſtant TRADE-WINDS, &c.

CHAP. I.

An Account of the Conſtant Trade-Winds, the Monſoons, the Periodical Trade-Winds, the Land and Sea Breezes, and the variable Winds that commonly blow in the Eaſt-Indies.

IN the Eaſt Indies, there is only one trade-wind that blows conſtantly, from the SE. quarter, between the latitude of 12° to 28° or 30° S. and from New Holland quite to Madagaſcar, and the Eaſt Coaſt of Africa. This trade, from the middle of May to the middle of September, extends more Northerly, viz. to the latitudes of 8°, 6°, 2°, S. and ſometimes to the equator, eſpecially in the Eaſtern parts of India. Though this is ſaid to blow conſtantly, yet it is not properly ſpeaking, but will ſometimes vary quite round: this however is ſeldom; when it happens near the equinoxes, ſhips, between Mauritius and the Cape, have very ſtormy weather. *The conſtant SE. trade wind.*

The periodical trade-winds, or monſoons, are uſually ſaid to blow ſix months from one quarter, and ſix months from the oppoſite quarter; of which there are four in India, viz. the SW. and NE. the SE. and NW. monſoons. The SW. monſoon blows from about the middle of April to the middle of October; and from the latitude of 2° S. as far Northward as Japan, except in the Perſian Gulf and the Red Sea. The NE. monſoon blows through the ſame track, from the middle of October to the middle of April. The NW. monſoon and its oppoſite are confined to a more narrow ſpace, viz. between the latitudes of 2° and 12° S. and from New Holland to the North end of Madagaſcar. The NW. prevails in this track, all the time the NE. monſoon blows to the Northward of the *The periodical trade winds, or monſoons.*

equator; and the SE. monſoon, during the other half of the year, which is all the time that the SW. monſoon blows in North latitude.

The fair and rainy ſeaſons. All over the Eaſt-Indies, the Weſterly monſoon, as well NW. as SW. brings the rainy ſeaſon, with frequent ſqualls and dirty weather; and the Eaſterly monſoon brings fair weather, except on the Coaſt of Coromandel, and the North part of Zeloan, where the rainy ſeaſon is from October to January.

The changing of the monſoons. The changing of theſe monſoons is commonly gradual, and ſome years happens near a month ſooner than in others. The change of the NE. and SW. monſoons is often attended with violent ſtorms, which to the Eaſtward of Malacca are called Tuffoons, and to the Weſtward the Breaking up of the Monſoons: they ſeem much the ſame as Weſt-India hurricanes; but never happen at the change of the NW. and SE. monſoons, though in thoſe tracks, at that ſeaſon, there is often very bad weather.

The land and ſea breezes. The land and ſea breezes prevail, more or leſs, near almoſt all the coaſts in India, during the NE. monſoon: they alſo blow ſometimes during the SW. monſoon, but not ſo general.

The variable winds The variable winds prevail chiefly in the Streights of Malacca, Perſian Gulf, and Red Sea; likewiſe all over the Indian Seas Northward of 12° South latitude, near the changing of the monſoons.

The SW. monſoon. This is a general account of the winds in India; but to be more particular. The SW. monſoon begins to blow near the coaſt of Africa, ſoon in March; and towards the end of that month, along the ſhores of Arabia Felix (within the Red Sea) to Cape Roſulgat. Early in April, it prevails along the coaſts of Guadel, Seindy, Guzurat, and quite to Surat, by the middle of that month: but from Bombay, along the Coaſt of Malabar, as far as Cochin, this monſoon is not well ſet in 'till between the latter end of May and the middle of June, by which time it is general. From Cochin Southward to C. Comorin, the monſoon begins half a month ſooner than at Bombay; and in Tuttacareen Bay, and along the South ſide of Zeloan, about a month ſooner than at Bombay, viz. between the end of April and the middle of May. At Bengal, and along the Coaſt of Orixa, this monſoon begins early in March; but more to the Southward, ſo far as Due Point, it begins fifteen or twenty days later; and on the Coaſt of Coromandel, it is between the latter end of April and the middle of May before it is well ſet in; but along the NE. ſide of Zeloan, from Crankanella to Point Pedro, it begins rather earlier by half a month, viz. between the middle and end of April: along the Eaſtern ſhores of the Bay of Bengal, it is between the middle and latter end of May before the SW. monſoon prevails, by which time it is general. In the Bay of Siam, and along the Coaſt of Cambodia, Cochin-china, Tonquin, and China, the SW. monſoon begins, as on the Coaſt of Golconda, between the beginning and end of April: this, however, is along the ſhores; for at a diſtance from the land, it is near a month later; for which reaſon, along the North end of Borneo, Luconia, &c. it does not blow 'till between the firſt and laſt of May.

The NE. monſoon. As the SW. monſoon continues only ſix months, and begins ſooneſt near the ſhores, it therefore ceaſes there firſt; and the oppoſite one (NE.) begins firſt near the ſhores, (except cloſe to the Malabar and Guadel Coaſts, where it never blows ſteady) and then ſpreads like the other, 'till it becomes general, through all thoſe ſeas, as above mentioned, where this periodical wind blows. To know therefore when a particular monſoon begins at any given place, it ought only to be conſidered, at what time the oppoſite monſoon begins, and in what track; and about ſix months afterwards the other monſoon may be expected.

Malacca Streights. The Streights of Malacca has not yet been mentioned, though it lies in the track of the SW. and NE. monſoons, becauſe the influence of thoſe monſoons, that blow only the breadth of Sumatra from it, and of the land and ſea winds upon the adjacent ſhore, is ſo great, that it may rather be called a track of variable winds; for no monſoon prevail-

lon

long here: however, during thoſe ſeaſons that the SW. or NE. winds blow ſtrongeſt without the Streights, it commonly blows gentle gales, moſt part of the day, from the ſame quarter, within; that is, from the Eaſtward in December and January, and from the Weſtward in June and July.

SE. and NW. monſoons.

The SE. and NW. monſoons differ in nothing from the SW. and NE. monſoons, but the track and the quarters they blow from (both already mentioned); and that the SE. winds ſet in from ten to twenty days ſooner to the Eaſtward of the Meridian of Bengal, than to the Weſtward of it.

Land and ſea breezes

Through all India, the NE. and NW. monſoons, when near done, blow faint; and then the land and ſea breezes begin near the ſhores, and continue to blow, more or leſs, (except on the Malabar Coaſt) untill the oppoſite monſoon commences, and gathers ſufficient ſtrength to blow ſteady; conſequently there are land and ſea breezes, in February and early in March, along the North Coaſt of Africa, the Coaſt of Arabia Felix, and Eaſtward near Guzurat, which yield to the SW. monſoons, that prevail in March and April; the ſame is to be underſtood of land and ſea breezes along the ſhores of China, Cambodia, Siam, the Weſt Coaſt of Sumatra, Java, Streights of Banca, and the Eaſtern Iſlands; as alſo over all the Bay of Bengal. Juſt in the ſame manner the SW. and SE. winds, having continued for five or ſix months, grow weak; and, ſooner or later, in October, according as the place lies, the land and ſea breezes begin to blow, from four to ſix, along the laſt-mentioned ſhores of Africa, Arabia, Zeloan, Bengal, China, Sumatra, Java, &c. but neither ſo frequent, nor ſtrong, as in the oppoſite ſeaſons; except on the Malabar Coaſt, where they begin then to blow from Surat Southward, to Cape Comorin; but concerning this, and ſome other tracks, a few remarks are proper in this place.

The land and ſea breezes on the Malabar, Guzurat, and Guadel coaſts.

Though the NE. monſoon is in general ſaid to blow in its ſeaſon, wherever the oppoſite SW. wind blows; yet this is not, ſtrictly ſpeaking, true; the Malabar, Guzurat, and Guadel coaſts being an exception to it; for, though the NE. wind blows (in the proper ſeaſon) through the ſea, Weſtward, from theſe coaſts to Africa, yet near the above ſhores it never blows ſteady for any time; on the contrary, between the latter end of October and middle of November the land and ſea breezes begin, along theſe coaſts, and continue for four months, and ſometimes longer. Theſe are ſucceeded by almoſt conſtant winds from NNW. to WNW. which continue till the SW. winds prevail, in May and June; there are therefore little or no land and ſea breezes on theſe coaſts, between the decay of the NE. and beginning of the SW. monſoons; but from the failing of the SW. monſoon, (October or November) till the ſtrength of the oppoſite wind is almoſt ſpent (February or March) there are almoſt conſtant land and ſea breezes; which is three times longer than any other open coaſt in India has the advantage of. A ſhip, bound to the Weſtward, between the middle of November and the middle of January, will ſoon croſs the track of land and ſea winds on theſe coaſts, and get into the ſteady NE. winds; but later, ſhe muſt be a great way off ſhore, before ſhe reaches the NE. monſoon (not that the land and ſea breezes ever reach far off ſhore, but the winds from NNW. to WNW. do); and if ſo late as the middle of April, ſhe will ſcarce have any NE. winds at all; but will be obliged to work with the winds from between the North and Weſt, untill the SW. monſoon commences.

The NW. winds on the aforementioned coaſts.

Theſe NW. winds, in February, March, and April, blow ſometimes ſo freſh, and cauſe ſuch a ſea, for fourteen or fifteen days, that even a good ſhip cannot work to the Northward: but they ſeldom or ever blow with ſuch violence forty, ſometimes thirty leagues off ſhore. If a land wind blows from theſe coaſts, either in the night or morning, a ſhip, working along, may depend on a ſea breeze, or at leaſt a wind along the coaſt, from the North-Weſtward, to carry her in ſhore again: and neither is the land or ſea breeze ever attended with ſqualls of thunder or rain, as the land winds frequently are, on every other coaſt in India.

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Land and ſea breezes in the Bay of Bengal. When the land and ſea breezes fail on the Malabar Coaſt, they begin (about the middle of February or beginning of March) at the North end of Zeloan, the Coaſts of Coromandel, Golconda, Orixa, Bengal, Aracan, Pegu, and Tanaſſary. They are uſually moderate, as thoſe on the Malabar Coaſt; but near the end of March (and ſometimes ſooner) the land winds begin at Bengal to come off, from the NW. quarter, with a furious ſquall, much thunder, lightening, and rain; though ſometimes without rain. Soon after this, theſe land ſqualls begin to come off at Balaſore, the Coaſt of Orixa, Golconda, and ſo proceed Southward to Zeloan, where they begin to blow late in April, and continue to come off, at times, during the whole SW. monſoon, quite from Zeloan to Bengal: however, they blow oftener, and uſually (not always) more violent, in April, May, June, and July, than in Auguſt or September, eſpecially between Vizagapatam and Point Palmiras.

Land ſqualls from Bengal to Zeloan.

Land ſqualls Eaſtward to China. Theſe land ſqualls prevail alſo, in thoſe months, along the Coaſts of Aracan and Tanaſſary, Cambodia and China, but neither ſo frequent, and ſeldom ſo violent, as on the Coaſt of Orixa. The Coaſt of Pegu, from the Negrais to the Syrian, is ſeldom or never troubled with them: but on the Weſt Coaſt of Sumatra and both ſides of Java, in March and April, the land winds come off, almoſt every evening, in a ſquall; ſometimes very hard, with thunder, lightening, and rain; which being ſoon over, is ſucceeded by a fair, moderate land breeze, that continues uſually untill the ſea winds begin. The ſea winds on this coaſt, in April and May, ſet in ſometimes with a violent, tho' ſhort ſquall; which ſeldom or never happens on any other ſhore. It is obſervable, that along the Coaſts of China, Tonquin, Cambodia, the Weſt Coaſt of Sumatra and Java, a land breeze is certainly ſucceeded by either a ſea breeze, or a wind along ſhore, ſufficient to bring any ſhip, that ran off with the land breeze, in with the land again, in the ſame manner as is mentioned on the Malabar Coaſt: but it is quite otherways on the NE. ſide of Zeloan, the Coaſts of Coromandel, Bengal, Tanaſſary, and Weſt ſide of the Bay of Siam; for there the land wind, or rather indeed the prevailing wind, will blow ſteady for three, four, to twelve days (and at Bengal, and Coaſt of Tanaſſary, often longer): this happens on the Coaſt of Coromandel, and on the Weſt ſide of Siam Bay, during the ſtrength of the SW. monſoon, in May, June, and July; as thoſe along the Coaſt of Tanaſſary and Bengal happen at the oppoſite months of November, December, and January. In the ſame manner, the SW. monſoons conſtitute a freſh, ſometimes a violent, ſea wind on the Coaſts of Tanaſſary, Pegu, Aracan, Bengal, Malabar, and Cambodia, that blows with little variation, during the months of May, June and July; as the NE. monſoons do on the oppoſite ſhores of Siam Bay, the Coaſts of Coromandel, Zeloan, and North Coaſt of Africa.

Coaſt of Pegu.

Sumatra and Java

Variable winds. At a diſtance from the ſhores, the winds become variable, through all the India ſeas, Northward of 12° S. latitude, in March, April, October, and November; that is, near the changing of the monſoons.

Between the Coaſts of Malabar and Africa. In the ſea, between Africa and the Malabar Coaſt, the NE. winds, growing weak, (in March) are frequently interrupted; ſometimes with the wind from the SE. or SW. but uſually from the NW. quarter; ſo that the winds may be ſaid to vary only between the NNE. and WNW. for in the middle of this ſea, late in April, the wind has been known to blow a gentle gale for eight days, at NWbW. and NW. and when the SW. monſoon grows weak, late in September the ſame (WNW. to NNW.) winds commonly prevail till the NE. monſoon commences.

In the Bay of Bengal. In much the ſame manner and time (March and October) the variable winds prevail in the Bay of Bengal; but as it commonly blows from the NW. quarter, between Africa and the Malabar Coaſt, ſo in the bay they commonly prevail more from the NE. than any other quarter: theſe laſt are however in the other ſeas.

Throughout

Throughout the China ſeas the variable winds perfectly reſemble thoſe in the Bay of Bengal. *In the China Seas.*

In the Southern track of ſea (between 2° and 12° South latitude) the winds, about the changing of the monſoon, are more perfectly variable than any where in India; however, if they prevail more from any one point than another, it is from the Weſtern quarter, or NW. to WSW. *The Southern Track.*

The Red Sea and Gulph of Perſia, though only ſeparated by Arabia, have different winds. The winds blow almoſt nine months in the year up the Red Sea, from the Southward, viz. from the end of Auguſt to the middle or latter end of May, when the wind veers to the N. and NNW. and commonly blows ſo 'till late in Auguſt. Whereas in the Perſian Gulph, the winds blow almoſt nine months down the gulph, from the NW. quarter, and about three months up. Theſe winds are not, however, ſo regular, nor of ſuch duration, as thoſe in the Red Sea; for they frequently interrupt each other, and are frequently interrupted by hard gales from the SW. chiefly off Cape Muſſeldem, and ſometimes by land breezes, which laſt prevail ſometimes in the Red Sea. In the Perſian Gulph, the NW. and WNW. winds prevail almoſt all the time the Southerly winds blow in the Red Sea, viz. from the end of September to July; from which time, 'till near October, the SE. winds are moſt frequent. *Winds in the Red Sea, and Perſian Gulph.*

Severe ſqualls and very bad weather ſometimes happen in moſt parts of India, eſpecially during the Weſterly monſoons; but devouring ſtorms and tedious calms (almoſt as bad in their conſequences as ſtorms) generally happen near the ſhifting of the monſoons; that is, the ſtorms, from the middle of April to the middle of June, and from the end of September to the end of November; the calms, in March, April, and May. *Storms and great calms.*

Between the Malabar Coaſt and Africa, when theſe ſtorms happen (which is not every year) they uſually blow harder, and happen oftener, between the middle of May and middle of June, than in October and November. They firſt begin with hard ſqualls and rain, and blow chiefly from the WSW. and are preceded by a very great ſquall from that quarter, one, two, or three days. Thoſe that happen in November commonly begin in the Eaſtern quarter, and veer round to WSW. and SW. The calms, in this ſea, are ſeldom of long continuance; but are moſt troubleſome to ſhips bound Weſtward, in March and April, from Cochin, &c. through the Lacadiva Iſlands; where, ſometimes, very little progreſs will be made in five or ſix days. *Storms and great calms between the Coaſts of Africa and Malabar.*

In the Bay of Bengal, there ſometimes happen as ſevere ſtorms as any in the world: theſe are, however, more violent at Bengal, and along the Coaſts of Orixa, Golconda, and Coromandel, than any of the ſhores Eaſtward of the Negrais. They happen alſo oftener, and are generally, though not always, more violent, in October and November, than in the oppoſite ſeaſons of April, May, or June. At Bengal, and all Northward of Cape Negrais, the ſtorms that happen in October and November (for they ſeldom or never come earlier or later) begin with a drizzling rain, and the wind about ESE: the wind then increaſes, and veers to E. ENE. NE. and N. and ends there; except it is extremely furious, in which caſe it ſometimes veers to NNW. and NW. where it ends, blowing hardeſt from the NNE. to NNW. or NW. quarter, with heavy rain the whole time. At this ſeaſon a ſtorm will ſometimes blow for a day or two, from E. ENE. to N. and then fall calm for a few minutes; and then begin to blow ſeverely at SSW. for half an hour, and quickly end with fair weather. This is not near ſo hard as the laſt-mentioned ſtorms; but is, like them, attended with much rain, and continues much longer, for the ſevere ſtorms laſt not above ſix or eight hours. At Bengal, the ſtorms that happen at the beginning of the SW. monſoon, are early in June: the moſt ſevere begin at WSW. with rain, and veer to W. WNW. and NW. where they blow ten or twelve hours with great fury, and end. A ſtorm at this ſeaſon, to the Southward of Point Palmiras, will ſometimes begin as above; and then veer from NW. to N. NNE. and *Storms and great calms in the North Part of the Bay of Bengal.*

NE. after which falling calm for a quarter of an hour, it will begin again, and blow hard at SW. for an hour or two longer, and then end; or it will begin at ESE. veer to E. ENE. and NE. then fall calm, and begin again at SW. &c. as above. Theſe ſtorms are not near ſo hard as the laſt mentioned, that end in the NW. quarter: all, however, are attended with rain.

Storms and great calms in the South Part of the Bay of Bengal.

On the Coromandel Coaſt, and all over the Bay, Weſtward of the Andaman Iſlands, and Southward of Cape Negrais, the ſtorms that happen in October and November blow with great fury from the WSW. to WNW. and NW. Sometimes they begin in the SE. but oftener in the NE. quarter. The ſtorms at the other ſeaſon happen uſually between the middle of April and middle of May; they always begin at NNE. veer to the NE. and E. or EbS. where it ends. It blows hardeſt from NE. to E. is attended with much rain and a very great ſea. The large ſurff on ſhore, with thick weather, and perhaps drizzling rain, ſhews its approach, twelve hours at leaſt, before it comes. Sometimes, at this ſeaſon, it will begin, as above, at NNE. veer to NE. E. S. SE. and then to SW. where it will end, with great fury: this, however, is ſeldom; but when it happens is remarkably ſevere. Upon this coaſt there happen ſometimes hard gales from the NE. about January; but theſe are by no means ſo hard as the April ſtorms. It is alſo remarkable, that both the April and January ſtorms blow much harder to the Southward than Northward, that is, between Pondicherry and Negapatam, than Madraſs and the North end of Armagon. If any damage ariſes from them to ſhipping, it is cauſed by the great ſea, and anchoring too near the ſhore, ſo that, if the cable parts, they have not room to veer; for it ſeldom or never blows ſo hard, but a ſhip may carry her courſes, and clear the land, ſtanding to the South-Eaſtward. Calms are ſeldom of long continuance here: they happen chiefly in February, March, and April, in the middle of the Bay, and near the Eaſtern ſhores; alſo along the NE. Coaſt of Sumatra, quite up to the Streights of Malacca.

Storms and great calms in the China Seas.

The China ſeas and adjacent iſlands are liable to ſevere ſtorms and ſhort calms, at the ſame ſeaſons, and from the ſame quarter, as thoſe in the Bay of Bengal, Northward of the Negrais; ſo that what is already ſaid of them, is, in all reſpects, true here: only let it be added, that ſtorms happen ſometimes ſooner here than in Bengal; for they have been met with in Auguſt and September, as well as October and November: thoſe in September and October are however moſt frequent and violent.

Calms near the Equator.

Between the latitudes of 12° and 2° S. it is already ſaid, violent ſtorms ſeldom or never happen: however, there are calms that laſt four, five, and ſix weeks. Theſe calms happen always, more or leſs, in March and April; and between 2° or 3° North, and 2° or 3° South latitude, and the meridians of Bengal, and the head of the Maldivas. They are not of long continuance every year, though ſometimes they extend (are often troubleſome) beyond the above-mentioned limits.

CHAP. II.

An Account of the Setting of the Currents, and the Strength thereof, in the ſeveral Parts of Eaſt-India.

Currents.

THE currents in India, as well as in other ſeas, are generally ſo various and uncertain, that it ſeems impoſſible to give any account of them, further than experience juſtifies; which is as follows, viz. The winds are found chiefly to cauſe currents, but more eſpecially in

in ſhoal water; therefore currents are commonly near the ſhores; but, though the winds principally occaſion currents near the ſhores, yet great ſtreams from adjacent rivers, co-operating with the winds, often increaſe theſe currents; as, on the other hand, the direction of theſe ſtreams often retards, and ſometimes cauſes a current to run againſt the winds. The ſituation of the place, as an iſland, ſtreight, bay, &c. binds, breaks, and otherways influences thoſe general currents; as do the moon and ſtorms of wind ſometimes; but that is of a ſhort continuance.

On the Coaſts of Africa, Arabia, the Red Sea, Perſian Gulph and Guadel Coaſts.

Along the NE. Coaſt of Africa, from Cape Baſſes to Guardefoy, and from thence along the Coaſt of Arabia to Cape Roſulgat, and on the Guadel Coaſt, the current begins to ſet from the SW. quarter in March and April, and ſo continues till September; when it ſets from the NE. the other ſix months. From May to September the ſtream commonly runs out of the Red Sea; and from October 'till May, runs into it from the Ocean. In the Perſian Gulph the current generally runs out, all the time that it runs into the Red Sea from the Ocean; and runs in from May to September, when the ſtream runs out of the Red Sea.

Coaſt of Guzurat round to Bombay.

From Bombay to Diu Head, there is ſeldom any remarkable current; that track having commonly regular and ſtrong tides; except in Auguſt and September, when the ſtrong freſhes out of the Rivers Cambay, &c. cauſe a ſtrong current to the Southward.

Malabar Coaſt.

From Bombay Southward to Cape Comorin, there is almoſt a conſtant current, though ſometimes it is very ſmall, from NNW. and NW. except from October to January, when there will ſometimes be a briſk current from the SE. but that runs chiefly between Comorin and Cochin, ſeldom reaching more Northerly, or laſting long.

Tuttacareen Bay.

In Tuttacareen Bay, there is commonly a ſmall current to the Northward, from May to September; and the other half year, from the Northward to the Southward.

At Zeloan.

From Barbarien Iſland, along the South ſide of Zeloan, there begins to run a ſtrong current to the Eaſtward, early in May, and uſually continues 'till September; but in thoſe months there is little or no current near the E. ſide of Zeloan, viz. from about Anquin to Crankanella; but from that bay the current again begins to run along the ſhore to the Northward, and continues acroſs the gut to the Coaſt of Coromandel. From the latter end of September (ſometimes ſooner) to February, the current runs from Point Pedro, along ſhore, to the SE. SSE. S. SW. and W. quite round to Point de Gall, where it ceaſes; and the current out of Tuttacareen is met.

Along the Coaſts of Coromandel, Golconda, and Orixa.

Very near the ſhores of Coromandel, Golconda, and Orixa, about the latter end of January, or early in February, the current begins to run to the Northward, and continues, with little intermiſſion, 'till about the latter end of Auguſt, when it changes, and runs (near the ſhores) to the Southward, untill January.

Coaſt of Bengal.

From Balaſore Eaſtward, along the bottom of the bay, to Chittygong, tides out and into the rivers prevail moſt part of the year, except in September, October, and November, when there is uſually a current to the WSW.

Along the Coaſt of Aracan.

Between Xittigam or Chittygong and the Negrais, there is ſeldom any ſtrong current, and oftentimes none; however, from the middle of December to May, there often runs a ſmall current to the Southward; and from June to September, to the Northward.

The Coaſt of Pegu.

Along the Pegu ſhores, the currents are much the ſame, in every reſpect, as from Balaſore to Xittigam.

The Coaſt of Tanaſſary.

The coaſt, from Junkcelone Head Northward to near Martavan, is more ſubject to tides than currents; however, when any happen, it is commonly from the NE. quarter, in September and October; or from the SW. quarter, in November to March.

From

In the Bay of Bengal. From the end of September to near Chriſtmas, through the whole Bay of Bengal, there generally prevails a current, more or leſs, Weſtward of S. or Weſtward of N. for it runs both ways at times, though the firſt is much more prevalent than the laſt.

In the Streights of Malacca. Various tides (ſome very ſtrong) chiefly prevail through the Streights of Malacca; but they are not ſo regular as at Bombay, and ſome other places, being conſiderably influenced by currents from the adjacent ſeas: theſe currents are, however, of ſhort continuance, and are commonly from the Eaſtward in November, December, and January, and from the Weſtward in May, June, and July.

Weſt Coaſt of Sumatra and Java. Along the W. coaſt of Sumatra, and S. of Java, the current commonly runs as the monſoons blow; from the NW. between October and May, and from the SE. from May to October.

Streights of Sunda. In the ſtreights of Sunda are ſometimes very ſtrong currents, eſpecially in the narroweſt part; but they are not very ſteady: however, from January to April, the current generally runs from the Weſtward into the Streights; and all the other part of the year, it commonly runs out of the Streights from the Eaſtward.

Streights of Banca, Bay of Siam, and Coaſt of China, Cambodia, &c. In April the currents begin to run, more or leſs, to the Northward, through the Streights of Banca, and paſt the Streights of Malacca, and along the W. ſide of Siam Bay; but along the NE. ſide of the Bay, the currents run pretty ſtrong to the ESE. 'till Eaſtward of Point Uby, when it again bends to the NE. quarter, and ſo runs along the Coaſts of Cambodia, Cochin-china, and China, 'till September, when the oppoſite monſoon and currents begin to prevail, from the NE. quarter, 'till March or April.

Through the China Seas. Through the China ſeas (at a diſtance from the ſhores) the current generally runs, more or leſs, to the NE. quarter, from the middle of May 'till the middle of Auguſt, and from the middle of October to March or April.

Currents quantity. Such are the uſual and general currents in India, with regard to the ſeaſon when they prevail, and their quality: the quantity of any of them it is impoſſible to aſcertain, being different in different places, and at different ſeaſons, nay different hours at the ſame place: ſomething, however, is proper to be obſerved on this head.

Through the China ſeas, and along the adjacent ſhores, the currents from the NE. quarter are commonly much ſtronger in October, November, and December, than the oppoſite currents in May, June and July: they run particularly ſtrong within the iſlands and ſhoals that lie near the ſhores, as many ſhips, bound to Canton, that have fallen among the iſlands to the Weſtward, have experienced; for they have been obliged to warp up quite to Macoa: the ſtrongeſt currents, however, in theſe ſeas, are along the Coaſts of Cambodia, the latter end of November, where, from Cape Avarillo, 'till beyond Pullo Caceir de Terra, it certainly runs from 50 to 70 miles to the Southward, every 24 hours. Some part of the ſtream, running into the Streights of Malacca, cauſes the tides to run nine hours one way, and only three hours the other. The ſame happens ſometimes in May and June, from the current cauſed by the SE. and SW. monſoons.

Streights of Malacca, Banca, and Sunda. Through the Streights of Banca, (nay, during the neaps,) it will run two or three days one way. Though the ſtreams in the Streights of Malacca, Banca, and Sunda, partake, in a great meaſure, of the nature of tides, yet they never run ſo ſtrong in the two firſt, as in the laſt, where, from Bantam Point to Angar Point, the currents will ſometimes run from the Eaſtward, two or three miles an hour, for two or three days together: this happens chiefly in June, July, and Auguſt; as the ſtrongeſt ſtreams, in the Streights of Banca, run to the Southward, from the middle of November, to the middle or end of January.

Weſt Coaſt of Sumatra and Java. Along the SW. Coaſt of Java and Sumatra there is not uſually any ſtrong current, thoſe cauſed by the monſoons ſeldom running above $\frac{1}{2}$ or $\frac{3}{4}$ of a mile an hour; except off Flat Point,

Point, where the ſtream runs ſometimes ſtrong to the Northward for ſeveral days; but this is properly the Streights of Sunda.

The current from the NE. quarter, in the Bay of Bengal (like that in the China Seas) runs generally much ſtronger than the oppoſite currents, eſpecially off Jackernaut Pagoda, where it is thought to run ſtrongeſt. It will run for many days from two to four miles an hour, late in October and November; whereas the current from the SW. ſeldom runs above half ſo ſtrong. Hard gales of wind, that happen ſometimes at the beginning, or during the SW. monſoons, have been known to cauſe a ſtrong current to the Southward along the Weſtern ſhores of the Bay, for two or three days, even in the months of April, May, June, July, and Auguſt; but there ſeldom or never is any check to the current, near the ſhores, from the NE. quarter, in October and November. *Bay of Bengal.*

Eaſtward of Syrian River, is the Coaſt of Martavan, where the tides are ſo ſtrong, that no anchors or cables can hold a ſhip: the floods come in with a boar or ſurff from ten to fourteen feet perpendicular height; ſo that all ſhips ſhould carefully avoid this track. *Martavan.*

The currents round Zeloan are liable to ſudden and unaccountable alterations; for example, a ſhip has been forced to anchor in a calm, near Barbarian Iſland, by a current, or a tide, ſetting at the rate of three miles an hour, right upon the ſhore: thoſe ſtreams, however, are neither frequent, nor of long duration; but the uſual general current along the South ſide of the iſland runs, in June and November, from 2 to 3½ miles an hour. The current on the NE. ſide of the Iſland is ſeldom or never ſo ſtrong; and in Tuttacareen Bay, in June and November, the current ſeldom exceeds 8 miles a day, that is, off ſhore; for near Zeloan it ſometimes runs faſter; but near the main there is ſeldom any current. *Iſland Zeloan.*

In the large track of ſea that lies between this coaſt and Africa, there is ſeldom any great current; but in Auguſt and September the freſhes from the Cambay rivers uſually cauſe a current to the Southward, of 8 to 30 miles a day: this is chiefly found to the Northward of 17°; and near the land it gradually diminiſhes to December, during which month, and the two following, there is little, and often no current; but in March, the almoſt conſtantly Northerly winds cauſe a ſmall ſtream to the Southward, of 8 to 13 miles a day: this, however, is not conſtant. But ſhips going Weſtward find a conſtant current to the SE. and SSE. during the months of February, March, and April, of 12 to 30 miles a day: they meet with it from 20 to 40 leagues off ſhore; and before they have paſſed it they muſt be 100 to 140 leagues Weſtward of Cochin. *Between the Coaſts of Africa and Malabar.*

The Rivers of Scindy, &c. co-operating with the NE. monſoon, cauſe a current to the WSW. and SW. along the Coaſts of Guadel, Arabia, and Africa, to Cape Baſſes, from September to February, of 8 to 30 miles a day. In March the oppoſite current begins, and runs with much the ſame force; but neither is conſtant; for a current has been found off Cape Roſulgat, early in January, of 30 miles to the Northward, in a day, though the wind at the ſame time blowed very hard at NW.

The current that happens in the outward Gulph of Perſia, (between Cape Roſulgat and Cape Jaſques) is fluctuating and not frequent, and along the ſhores. In the inner gulph, there are pretty regular tides: a current however runs often in the middle of the gulph, and ſometimes (though rarely) along the ſhores: that in the middle is generally down, as thoſe near the ſhores run uſually up the gulph: neither are very ſtrong (8 to 20 miles a day) nor of long continuance, and the times they prevail uncertain. *Perſian Gulph.*

The ſhores of the Red Sea have alſo ſome tides; but not half ſo ſtrong, conſtant, or regular, as thoſe in the Perſian Gulph. The currents are uſually near the middle of the ſea, and run from 10 to 20 miles a day: this, however, is chiefly true below Mocha; for between Mocha and Judda the current often runs to the Northward, even in June, when the Northerly winds blow ſtrongeſt; and there is a ſtrong current, at the ſame time, running Southward off Babelmandel. *Red Sea:*

CHAP. III.

The beſt Method to navigate Ships from Port to Port in India, *at all Times of the Year, in Conſequence of the Winds and Currents.*

IN conſequence of the winds and currents deſcribed in the two preceding Chapters, it will be found beſt for ſhips to navigate between the moſt frequented ports, in the following manner.

From Bombay to the Red Sea.

In November and December, In November and December, a ſhip bound from Surat or Bombay, being got once a little off ſhore, will have a freſh gale at NE. with which ſteering large, ſhe will have a ſpeedy paſſage to the Red Sea; but as it blows hard, eſpecially Weſtward of Soccatra, and the weather is often obſcure and cloudy, it is beſt not to attempt ſeeing that iſland (becauſe running paſt to the Southward might be attended with very bad conſequences): but keep to the Northward thereof, and fall in with the Coaſt of Arabia, near Aden; being careful to keep the lead going, and a good look-out; for Aden is a high promontory, with a bay on the Eaſt ſide, about 14 leagues long, and near to Aden, about 3 leagues deep, in which a ſhip may eaſily be embayed; for, though Aden is high land, yet it has been taken for the Stone Iſlands; becauſe the cod of the bay, being very low land, is ſeldom ſeen: however, the water is ſhoal in this bay, and if a ſhip keeps in 35 or 40 fathoms, ſhe will neither be embayed, nor hurt by any thing on this coaſt.

From Aden to Mocha. From Aden, the inſtructions in the Coaſting India Pilot, or New Directory, are very good; only obſerve, that if the ſhip is not large, ſhe may go into Mocha Road between the ſands and the main, through which ſhe finds 21 to 22 feet water, and by this means avoids much trouble. As it blows hard along ſhore, at this ſeaſon, a ſhip, when round the ſands, can ſeldom luff into the road, but is often obliged to anchor to leeward, and wait (riding hard) for many days, for eaſy weather to warp up.

Bombay to the Red Sea, January and February. A ſhip going the ſame voyage, in January and February, will have much the ſame winds, but more moderate, and weather very fair: it is beſt for her, therefore, to ſteer for the Eaſt end of the iſland Soccatra, taking care to be in the latitude of it, before the Weſting is run down, 20 or 30 leagues: the land, being high, is to be ſeen far off (12 to 16 leagues) nor is there any unſeen danger near it. She may range all along the North ſide, which lies about W¼N. 20 leagues; and from the Weſt end ſteer directly for Aden, heaving the lead as ſhe draws near the Coaſt of Arabia.

In March and April. In March and April, ſhips bound this way will have fainter and leſs conſtant NE. winds than in the four preceding months, and frequent winds from the NW. quarter, with fair weather and calms. The land and ſea breezes, or perhaps the SW. winds and currents, being now begun near the ſhores of Arabia, ſhe muſt, to avoid them, ſteer from Bombay WSW and SW. ſo as to paſs 10 or 12 leagues to the Southward of Soccatra, and after getting in with Cape Guardefoy, work up along the Coaſt of Africa, 'till paſt the White Rock, and then croſs over for Aden. If a ſhip leaves Bombay in April, it is more eſpecially neceſſary to keep well to the Southward of Soccatra, becauſe, if ſhe cannot weather that iſland with a SW wind, ſhe muſt loſe her paſſage; but if ſhe cannot reach the Coaſt of Africa, ſhe can always work along ſhore high enough to fetch Aden; from whence, even in June and July ſhe may work up to Mocha, by keeping very near the ſhore: ſhe will then, in a great meaſure,

meaſure, avoid the currents, and ſometimes, during the ſprings, have a current in her favour: the winds alſo will vary often, and be moderate; but when the winds or current are ſtrong down the Gulph, ſhe muſt anchor. Some late ſhips, by not keeping ſufficiently to the Southward, have loſt their paſſage, and lain at Soccatra 'till October, and then proceeded on their voyage. The road is ſafe, and about the middle of the iſland, on the North ſide, in depth from 9 to 7 fathoms. The people are civil; and the place affords good water, fiſh, fowls, ſome ſheep and cattle. No ſhip ought to keep near the African Coaſt about 15 or 20 leagues Weſtward of the White Rock; becauſe there are deep bays, full of banks, rocks, and eddy currents, along the ſhore, 'till paſt Babelmandel. The Bay of Zeyla is remarkably ſo; in which the Robert galley from Bombay was near loſt, about the year 1740. *Soccatra.* *Zeyla.*

The navigation up the Red Sea, from Mocha to Judda, is the mid-channel, the ſhores being incumbered with many iſlands and ſhoals; among which however there are ſafe channels, where Trankeys ſail to Judda, but they are unknown to Europeans. *Mocha to Judda.*

The proper time for this paſſage is doubtleſs between October and March, when the Southerly winds prevail; however, a ſhip well found and managed will always gain her paſſage, by perſeverance, even in May or June, the current running frequently to the Northward againſt the winds, in thoſe months, eſpecially in the ſprings. A good look-out, both night and day, is very requiſite in this track; for there are ſeldom ſoundings, and the ſhoals are ſo ſteep, that a ſhip will have 10 or 15 fathoms on rocks under one end of the ſhip, and no ground under the other at 60 fathoms.

From the Malabar Coaſt to the Red Sea.

The navigation from Anjango, Cochin, Calicut, &c. ports on the Malabar Coaſt, to the Red Sea, is, at each ſeaſon, much the ſame as from Surat or Bombay; only it is to be obſerved, that all ſhips from this coaſt ought to paſs through the Lacadiva Iſlands; and tho' ſhips that ſail in November, December, and January, may ſafely paſs through what part they pleaſe, yet ſhips that ſail in February, March, and April, ought not to quit the ſhore to the Southward of 10° or 11° of North latitude: this will prevent the riſque of being carried among the Maldivas, by the SSE. current, and high winds, that they certainly will then find among theſe iſlands: and as ſhe cannot avoid being well to the Southward, when paſt the Lacadivas (perhaps in 9° or 8° North latitude); therefore, inſtead of ſteering to the WSW. and SW. ſhe ought to ſteer WNW. or NWbW. to get into 11° 30′ North latitude, and then Weſt, which is the beſt track for a ſhip to ſteer that leaves the coaſt early in March: but late in March, or early in April, 9° or 10° North latitude is the beſt track; though this will ſeldom be found practicable, the winds blowing uſually from N. to WNW. She muſt therefore ſteer, cloſe hauled, betwixt the WNW. and SW. as the winds will permit; then to the Northward for the SSE. currents, rather than go too much to the Southward, ſtanding ſometimes a few hours NbW. N. or even NbE. but theſe trips ought ſeldom to be made, getting to the Weſtward being chiefly wanted; and ſhe ought by no means to croſs the Equator, nor even go beyond 2° North latitude, if to be avoided. When a ſhip, late in April, or early in May, has got within 50 or 100 leagues of the Coaſt of Africa, ſhe will generally meet with SW. to SSW. winds, that will carry her to windward of Cape Guardefoy; but if ſhe falls to leeward of Soccatra, in that ſeaſon, her paſſage is loſt.

From Surat and Bombay to Perſia.

The directions in the Coaſting Pilot, from Bombay or Surat, to go by Diu Head, and thence along the Coaſt of Guadel to Perſia, are good for early ſhips; but thoſe that ſail in March, April, or May, ought to ſtand cloſe hauled (either from St. John's or Bombay) with the NW. winds, to the WSW. and SW. 'till ſufficient to the Weſtward, to fetch a few

leagues

leagues to the Weſtward of Cape Roſulgat. Late in March, the SW. winds will be found, near the Coaſt of Arabia; and in April or May, ſtill further off ſhore; which renders the paſſage much eaſier than it was deemed in former times. The Succeſs galley, captain Barton, bound to Perſia, ſailed from Surat Bar, May 19, 1747, and ſtood from St. John's, cloſe hauled, to the W. and WSW. 'till ſhe met with the SW. monſoon, with which, on the other tack, ſhe eaſily made Cape Roſulgat in 26 days, and reached Gamberoon in 32 days from Surat.

From the Malabar Coaſt to Perſia.

Ships bound to Perſia from Anjango, Cochin, &c. and that can leave the Malabar Coaſt any time in November, December, or January, had beſt work along ſhore, with the land and ſea breezes, to near Goa; and then, taking the opportunity of the firſt briſk Northerly wind, ſtretch, cloſe hauled, over for the Coaſt of Guadel; but, if a ſhip in theſe months is (for fear of an enemy) obliged to go through the Lacadivas, her beſt way to go through them, is as far to the Northward as ſhe can, and then, according as the wind varies, work to the Northward and Weſtward in the offing, being careful not to go too far Weſtward; for, if ſhe does not weather Cape Roſulgat 10 or 15 leagues, ſhe will greatly lengthen her paſſage.

The Grandiſon, captain Fanton, bound to Buſſorah, left Tillecherry about the middle of December, OS. 1736, and paſſed thro' the Lacadivas, in 10° 40′ North latitude, having got 2° or 3° to the Weſtward; to the Northward of them, found moderate breezes from WNW. to NE. and with them ſteered ſometimes to the NW. WNW. and W. and ſometimes N. NbE. and NNE. as the wind varied, tacking every 3 or 4 hours; but upon the whole managed ſo, as to fall in 2 leagues Weſtward of Cape Roſulgat: this was 3 weeks after ſhe left Tillecherry, and it was 19 days more before ſhe got over to the Guadel Coaſt, about 25 or 30 leagues Eaſtward of Cape Jaſques, which ſhe reached the next day. In rounding Cape Roſulgat ſhe had often ſtrong gales from NNE. to NNW. with thick hazy weather, occaſioned by fine duſt blowing from the ſhore, that covered her rigging, tables, &c. When this ſhip was without the Lacadivas, if ſhe had ſtood leſs to the Weſtward, and more to the Northward, ſo as to have fallen in with the Coaſt of Guadel, her paſſage to Cape Jaſques would have been ſhortened 10 or 15 days; as was experienced the ſame year and ſeaſon by the Richmond, captain Sutcliff, and the Poultney, captain Caſtles, which put off from Cochin, and by working in this way, made the Coaſt of Guadel, along which they found either land or ſea breezes, or moderate Eaſterly winds: the Grandiſon alſo found Eaſterly winds along this ſhore; nor would ſhe have reached it in 19 days, if ſhe had not (during the ſprings) met an accidental current, that carried her for 3 days from 25 to 30 miles a day, right againſt the wind; for it is remarkable, that at this very time ſhe was under her courſes, the wind blowing a ſtrong gale at North.

Ships that leave the coaſt in February or March, ought to make the Coaſt of Arabia, between the Iſland Merceira and Cape Roſulgat; and therefore, if they paſs through the Lacadivas (well to the Northward) working to the North and Weſt as the winds will permit, in the ſame manner as an early ſhip, but more to the Weſtward. An example of a very late ſhip will ſet this in a clear light. The Succeſs galley, bound to Perſia, left Cochin April 20, 1757, paſſed through the Lacadivas about the latitude of 9°; after which ſhe had ſmooth water, and ſteady moderate breezes, between NbW. and WbN. but chiefly from NWbN. to NWbW. with theſe ſhe worked to the Weſtward, and was careful ſometimes to ſtand a few hours N. and NbE. notwithſtanding which, by the time ſhe had got between 11° and 12° Weſtward of Cochin, ſhe was near the latitude of 17° North; and as the wind was then very ſteady at NWbW. ſhe tacked and ſtood N½E. and as ſhe ſtood to the Northward, the wind veered gradually to WNW. WbN. and W. with which ſhe kept

cloſe

cloſe hauled N. NbW. and NNW. and as ſhe approached the Coaſt of Arabia, the winds freſhened, and came to WbS. WSW. and SW. with which ſhe made the Iſland Merceira, and then bore away round Cape Roſulgat, with a freſh gale, along ſhore: being round the cape, ſhe had three or four days light variable winds, with which ſhe ſailed to Muſcat, and anchored in the harbour ſome time in May.

Working along ſhore.

But if a ſhip, in theſe late months, inſtead of going through the Lacadivas, chuſes to work to the Northward along ſhore, 'till near or above Goa, and then ſtand over for the Coaſt of Arabia with the firſt briſk Northerly wind, it is equally ſafe; and will ſometimes ſhorten, and ſometimes prolong the paſſage. If the ſhip is at Cochin, Calicut, &c. (Malabar ports) and finds a briſk ſpirt from the Southward, or land and ſea breezes, or even moderate though pretty variable winds, from N. to WNW. all which ſometimes happen, it is much the beſt to coaſt Northward; becauſe the coaſt lying NNW. ſhe really goes ſo much in her way as ſhe gets; whereas, was ſhe to put off ſhore, when theſe winds prevail near the land, ſhe would certainly find light winds and calms among the Lacadivas, and be driven to the SSE. by the current, without getting proportionably to the Weſtward: but if a ſhip, at leaving any of theſe ports, finds freſh gales, a chopping ſea, and ſmall current from NW. and NNW. it is much better to run off ſhore; for thoſe uſually continue 6, 8, to 15 days, near the ſhore; nor can a ſhip gain any ground by working againſt them; but they aſſiſt her in running off ſhore, where ſhe will certainly meet moderate winds to work with.

In the Gulph of Perſia.

From October to March, a ſhip, going either in or out of the Gulph of Perſia, had beſt keep along the Guadel Coaſt from or to Cape Jaſques, though that coaſt is little known to us; but from March to September, mid-channel, or rather neareſt the Arabian Shore, is beſt: but none ought to go within leſs than 2 or 3 miles of the ſhore, between Cape Roſulgat and Muſcat; becauſe there is no ground 'till extremely near the land; and ſometimes tide upon the ſhore, which would oblige a ſhip to anchor in 55 fathoms, within $\frac{1}{4}$ of a mile of the ſtrand, under the prodigious high and long mountain of Curiatta. From Capt Jaſques quite up to Karack, the beſt track is, to Gambaroon Road, between the Iſlands Larack and Ormus, leaving Kiſhme on the larboard ſide. A ſhip may go between Ormus and the main, keeping cloſe to the iſland; but the channel is much narrower, and there is leſs water than through the other. The beſt track, from hence up to Karack, is within the Iſland Kiſhme, and all the iſlands along the Perſian Shore, except the little Iſlands of Jarack, Indernea, Monjela, &c. that are too near the main. At Gambaroon, a pilot may be got to Karack, or Buſſorah; but one, 'till paſt Kiſhme, is enough; for when paſt the ſtreight, keeping a moderate look-out, and the lead going, is all that is neceſſary.

The Coaſt of Arabia, from Cape Muſſeldom to Bahareen, is unfrequented, and therefore unknown to Europeans; but many ſhips go from Karack without Kiſhme, Polior, and all the other iſlands, except the Two-Tombes (Raze and Nabejou), Bomoſa, Surde and Nobſlure, between which laſt and Polior they paſs in 50 fathoms water. They may alſo go to the Southward of all thoſe laſt-mentioned iſlands; but it is ſeldom done: and either way muſt always prolong the paſſage; becauſe the capes and iſlands very much break the force of the NW. winds and currents near the ſhores, along which there are uſually more or leſs tides, and often a current, that will run 3 or 4 days to the Weſtward; but during the ebb, or if a current ſhould happen to run Eaſtward, a ſhip can always anchor with ſafety under ſome cape or iſland; ſo ſhe can if the winds blow too hard down the gulph: but the middle channel has no ſuch advantages; for there are no perceptible tides, the currents ſeldom run up, but generally down the gulph, and the NW. winds ſometimes blow with great fury, from which there is no ſhelter, nor place to anchor with ſafety in, without loſing much ground.

The caſe of the Grandiſon, captain Fenton.

The latter end of January, 1737, the Grandiſon, captain Fenton, at 7 A. M. the Iſland Karack bearing WNW. about 8 leagues, the wind at SSW. it quickly veered to SW. and blew ſo extremely hard, that ſhe could carry only a reefed main-ſail and whole fore-ſail, with which, cloſe hauled, ſhe fetched under the lee of Ormus, and anchored in the afternoon, near the old caſtle; but had ſhe been embayed between Jaſques and Ormus, ſo as not to be able to clear the ſhore, ſhe muſt have anchored without any ſhelter, and where the wind and ſea was ſo great, that it is doubtful whether all her anchors could have held her. That evening the gale ceaſed, and before morning a fine land-wind ſprung up from the Northward, with which ſhe ran out, and paſſed with veerable moderate winds up the middle channel, leaving Larack, Kiſhme, Polior, and all the iſlands near the Perſian Coaſt, to the Northward, and the Two-Tombes (Raze and Nabejou), Bomoſa, Surde and Nobſlure, to the Southward of her; but being as high as the Iſland Baſheab, ſhe was taken with a violent gale from the NW. and after lying 24 hours under her main-ſail, ſhe was obliged to bear away, and having run within the NW. end of the Iſland Kyne or Queſche, ſteered along the inſide of it, 'till ſhe came a-breaſt the village near the Eaſt end, and then anchored 'till the weather was over, which ſhe might as well have done under Baſheab, had ſhe been in ſhore, at the beginning of the gale; ſince the Richmond and Poultney, that were then working in ſhore, met no ſuch bad weather.

Of the Richmond and Poultney.

A Dutch Europe ſhip.

In 1755, or 1756, a Dutch Europe ſhip, bound up to Karack from Batavia, went to the Southward of all the iſlands, and having little wind and a current down the gulph, ſhe anchored ſomewhere on the edge of the Pearl Bank, about the latitude 25° 30′. The wind was at NWbN. and NNW. and greatly increaſed, as likewiſe did the ſea, ſo that, being unable to clear the ſhore, they were obliged to ſtrike yards and top-maſts, &c. and at laſt had almoſt foundered with all anchors a-head; but luckily for them they held faſt 'till the gale was over, or every ſoul would have periſhed on that deſert and unhoſpitable coaſt.

From Bengal to the Coaſt of Coromandel, &c.

From the middle of Auguſt to April, ſhips may ſail from Bengal to any part of the bay; but either earlier or later, it is very difficult to get out of the river; and though ſhips, that are going only Eaſtward or Southward, may ſail 10 or 15 days later, yet thoſe who ſail after the beginning of April, for the Coaſt of Coromandel, will find it difficult to get to the Weſtward, and perhaps loſe their paſſage.

Auguſt or September.

Ships that ſail from Bengal, in Auguſt or September, to the Coromandel Coaſt, will meet with unſettled weather; ſometimes moderate and fair, at other times hard ſqualls, thunder and much rain; the winds uſually SSW. to WNW. and ſometimes SSE. they ſhould therefore keep in 15 to 30 fathoms, cloſe along the ſhore of Orixa, Galconda, &c. for the benefit of the currents that begin to run along the ſhore to the SW. the wind however often blowing from the land, renders keeping near the ſhore difficult, eſpecially between Vizagapatam and Armagon: beſides, ſtanding off ſhore is ſometimes very advantageous; however, a ſhip ought ſeldom or never to go out of ſoundings. By going cloſe along ſhore, it is meant not to round the Bays of Salang, Maſſulapatam, and Montepoly; but thwart them, from point to point. Early ſhips will ſometimes have little or no current; and even thoſe who ſail later, will ſometimes find the current fail them, when Southward of 17° North; however, if they keep near the ſhore, they will have none againſt them, (except perhaps a freſh out of the adjacent river) and the winds ſufficiently variable to get the paſſage. They make uſe of every opportunity that offers, and tack as often and quickly as the wind changing makes proper.

The caſe of the Sarum.

The ſhip Sarum, bound to Madraſs, was, early in September, in ſight of Gordware and from thence ſtood, at times, SSW. and SbW. untill in the latitude of 15°; the weather fair, and water ſmooth; breezes moderate, from W. to WSW. In this latitude, finding

by obſervation, a current to the Northward, they immediately tacked, and after loſing 15 days, fell in with the high land 18 leagues to leeward of Point Gordware, which ſhewed the current to ſet North-Eaſtward; as indeed it always does in the offing, at this ſeaſon, if there is any current at all.

The William and Mary. September 10, 1739, the William and Mary, bound to Madraſs, was at that port at ſunriſe, the flag-ſtaff bearing Weſt, depth 28 fathoms: the wind was then a light land breeze, with which ſhe ſteered at the rate of 2 knots to the Southward: finding there was a current by the water deepening, and the bearing not altering, at 10 A. M. ſhe anchored in 35 fathoms, and found the current run, by the log, $2\frac{1}{4}$ miles an hour, NE. *A French ſhip.* A French ſhip, bound to Pondicherry, was then about 2 leagues Eaſtward of her, and ſuppoſed out of ſoundings; for being almoſt calm, before night ſhe drove almoſt out of ſight to the NE.

October and November. During the months of October and November, the navigation ſhould be much the ſame as in September; but no ſhips go from Bengal to the Coromandel Coaſt in thoſe months; becauſe the ſtrong NE. winds, ſea, and currents, render it extremely dangerous; for though ſome ſhips, on extraordinary occaſions, have rid out the whole monſoon, in 12 to 20 fathoms, yet it can anſwer no mercantile purpoſe, nor ought any ſhip to be on the coaſt from the beginning of October to the latter end of December. By a ſtorm that happened October 2, *French Squadron.* 1746, the greateſt part of Monſ. La Bourdenay's ſquadron was loſt (after taking Madraſs) in or near the road.

Decemb.r. Between the 10th and 15th of December, is ſoon enough for any ſhip to leave the mouth of Bengal River, for the Coromandel Coaſt; and, from that time to the middle of January, the beſt courſe (ſuppoſing her to Madraſs) is to the SW. directly, to make Armagon Hill. As ſhe approaches the coaſt, ſhe will probably have freſh gales, and a ſtrong current to the Southward; therefore keep the lead going, and a good look-out. Armagon Hill will be ſeen, when ſhe is 2 or 3 leagues without the North end of the Armagon Shoal, if the weather is not obſcure; but, as that ſand is very ſteep, it is dangerous to run in with it, when dark: whoever does, ſhould go ſlanting with the ſand, SWbS. or SSW. under an eaſy ſail, caſting the lead every mile ſhe ſails, and the moment ſhe ſtrikes ground, haul off ſhore, 'till clear of it. No ſtranger ought to go within the Armagon Shoal at this ſeaſon, the channel being too narrow.

If a ſhip in the evening is ſhort of Madraſs, it is better to anchor than lie-to: but if the ſea is too great, turn to windward; it will ſave lee way.

An Indiaman bound to Madraſs, in December, being off Pullicat in the evening, thinking ſhe had drift enough, brought-to all night, in order to run into the road in the morning; but, deceived by the current, found herſelf off Cabelon, or Covelam, at day-light; where ſhe anchored, and was 8 days in warping up to the road. Had ſhe anchored in the evening, or turned to windward all night, this could not have happened. Another Indiaman, that brought-to off Pullicat at night, found herſelf off Zeloan in the morning.

At this ſeaſon it is beſt to anchor in 9 or 10 fathoms, Madraſs flag-ſtaff Weſt; becauſe the boats, being light when they come off, can eaſily row againſt the wind along ſhore, and go aſhore loaden with a large wind, which they could not do if the wind was much Southward. Anchoring to the Eaſtward of the port, is to be obſerved at every port on this coaſt.

January. Early in January, a ſhip will find much the ſame currents and winds as in December, but more moderate: ſhe ought alſo to follow the ſame track, except the Eaſterly winds are very faint, in which caſe it is beſt to keep more to the Southward, and not go within 20 leagues of the land, 'till in the latitude of Madraſs, and then run Weſt for the road. This ought more eſpecially to be done, if the ſhip leaves the pilot in January; but whether ſhe leaves him early or late, if by meeting with light winds, ſhe ſteers ſome days SSW. or SbW. and the winds ſhould afterwards begin to blow freſh from NE. (perhaps in the latitude of 16° or 14 North) it is beſt for her to ſteer away W. WbS. or WSW. ſo as to fall in with Pullicat,

or

or rather with the South end of the Armagon Sand; eſpecially if it blows very hard, and is like to continue ſo.

Early in January, OS. 1739, captain Standard, coming to Madraſs from Pegu, as he approached the coaſt, had ſtrong gales at NE. and run directly for the road, where letting go his anchor, the cable parted: the ſame was done with a 2d and 3d: having then only the ſtream anchor left, he was obliged to make ſail, and run round Zeloan: but had he made the land near the Armagon Shoal, and brought-to, the gale would have been done before he drove paſt the road; at leaſt he would have had time to have got down his top-maſts, and when all was ſnug, brought up with 2 anchors, any where Northward of Madraſs; or in the road, where the Godolphin Indiaman from China, and ſeveral other ſhips from Bengal, rid the gale out ſafely.

The ſhip George, captain Taylor, belonging to our company, left Vizagapatam, January 17, OS. bound to Madraſs; and though the current ran near 1 knot to the Northward for ſeveral days before he weighed, yet he would work along ſhore: the conſequence was, what he got by the land and ſea breezes, he loſt by the current. In 6 weeks he reached the North end of the Armagon ſand; and finding, after 8 days longer turning, that he could get no further, he bore away for Maſſalapatam for water; and after ſtaying 3 days, ſailed E. ESE. and SE. 'till he got 4 or 5° Eaſting; where meeting the uſual Eaſterly winds, he ſtood S. SSW. SW. and W. 'till he fell in with Fort St. David, where he anchored, juſt 3 months after he left Vizagapatam; which he would have done probably in a fortnight, if he had at firſt proceeded from Vizagapatam, as he did afterwards from Maſſalapatam.

February. The month of February is the fineſt month in the year, through all the Bay of Bengal. Ships, in the middle or Eaſtern parts of the bay, are generally ſure of fine breezes from the Eaſtward and Northward; and near the Weſtern ſhores, of land and ſea breezes, or moderate gales from the WNW. to SW.; therefore all who are bound to the Coaſt of Coromandel, in this month, from Bengal, Orixa, or Galconda, ſhould keep well off ſhore, to avoid the calms, land and ſea breezes, and NE. currents, that then prevail from Zeloan to Balaſore. From Bengal, if early in the month, it is beſt to ſteer SbW. SSW. SW. WSW. and W.; and if it blows freſh from the NE. fall in directly with her port; but it will generally be better to run near the coaſt 8 or 10 leagues to the Southward of her port; becauſe ſhe is always ſure to get back; beſides, on getting ſoundings, or ſeeing the land from the maſt-head, ſhe can eaſily reach her port, by hauling upon a wind WNW. NW. or NNW. according as her latitude requires. Late in February, it is beſt to ſteer from the pilot South for ſome days, then SbW. SSW. and SW. &c. ſo as to fall in 20 or 30 leagues to the Southward of her port; for about the time ſhe approaches the coaſt, not only the Northerly currents run ſtrong, but the SW. wind begins to prevail along ſhore; ſo that ſhe muſt expect being obliged, when near the land, to ſteer WNW. or perhaps NW. cloſe hauled, with a leeward current; and make allowance accordingly, by keeping well to the Southward in the offing while it is in your power.

About 1745, or 6, captain Hopkins was coming from the Streights of Malacca to Madraſs, and early in February, OS. being paſt the middle of the bay, ſteered Weſt, in the latitude of Madraſs, with light gales at NE. and ENE. Being come within 20 leagues of the coaſt, the wind failed, and he got into variable light airs and calms, with a current to the Northward: this carried him near the Armagon Shoal, before he got into anchoring ground; from whence he was 3 weeks working up into the road: keeping 10 or 15 leagues to the Southward, would have prevented this misfortune.

The Succeſs galley left the pilot, February 13, 1757, and reached Madraſs the 22d inſtant. The Ganges left the pilot 10 days before her, and arrived at Madraſs 1 day after her; ſo that one ſhip was 9 days on her paſſage, and the other was 20. The Ganges had

had the advantage of ſailing 10 days earlier in the ſeaſon than the other; but the Succeſs was a better ſailing ſhip: however, the great difference in their paſſage aroſe chiefly from this; the Succeſs ſtood from the river S. SbW. SW. &c. as before directed, by which ſhe had ſteady breezes from the Eaſtward, the whole paſſage: the Ganges ſteered a more direct courſe to the South-Weſtward; and though ſhe went not along ſhore, yet, by being too much to the Weſtward, ſhe was out of the track of fair winds, and had much calm, with variable light winds, at the very time the other was ſailing with a fair ſteady breeze, about 40 leagues to the Eaſtward of her.

Ships bound from Bengal to any part in Orixa, or Galconda, ought, in the ſame manner, to keep off ſhore, 'till they are to the Southward of their port, according as they are late or early, and the NE. winds freſh or faint.

One of our Europe ſhips going from Bengal to Vizagapatam, in January, by not keeping off ſhore, was forced to anchor ſeveral days about the high land of Barras or Pondy; but luckily a breeze ſprung up, that carried her to her port, and ſaved the trouble of putting off ſhore, as the George was obliged to do, and by that means prolonged her paſſage 10 or 15 days.

Ships that leave Bengal in March or April, for the Coromandel Coaſt, ought more eſpecially to avoid going to the Weſtward at firſt: their beſt track (ſuppoſing the wind fair) is SbE. and S. keeping about 15 or 20 leagues to the Eaſtward of the meridian of Point Palmiras, 'till in the latitude of 13° or 12° North; and then SSW. and SW. 'till they ſee Zeloan, about Batacoola: but as the SW. winds range the Coaſt of Orixa at this ſeaſon, inſtead of a fair wind, ſhips uſually leave the Pilot with a freſh gale between WSW. and S. In this caſe, the beſt way is to ſteer, cloſe hauled, to the SSE. or even ESE. (rather than tack,) as the wind will permit. Theſe courſes will, in a few days, bring them into light breezes, uſually from the NE. quarter, with which they ought to ſteer S. SbW. SSW. &c. 'till they ſee Zeloan, as above. The wind will ſometimes continue ſo long in the SW. quarter, that a ſhip will be 3° or 4° to the Eaſtward of Point Palmiras before they change, and perhaps in latitude 15°. In this caſe, when the wind comes fair, it is beſt to ſhape her courſe direct for that part of the bay in latitude 13° or 12°, and 20 leagues Eaſt of Point Palmiras; and from thence directly to Batacoola, ſtand upon either tack as the wind will permit. The NE. breezes commonly begin between 17° and 15° N. when well to the Eaſtward; but ſometimes, after leaving the Pilot, you will have light WSW. W. WNW. and NW. winds, and ſo continue 'till the ſhip is in the latitude of 14°, nay 13°: let nothing, however, induce you to go Weſtward of the meridian preſcribed, but ſteer South; by doing of which ſhe will certainly have Eaſterly winds at laſt, which to the Weſtward ſhe would not have: or at leaſt they would be ſhort, weak, and unſteady, with much calm: on the other hand, it is by no means adviſeable to go near the Andamans, becauſe they make a dangerous lee ſhore, with a gale from the Weſtward; which ſometimes happens late in April. *March and April.*

About 26 years ago, the captains Jones, Warwick, &c. going this paſſage, were all loſt on thoſe iſlands, by ſuch a gale.

Ships that ſail before the middle of March, and are bound to the Northward of Madraſs, need not ſee Zeloan, but being got into 10° or 10½° North, may ſteer Weſt for the coaſt. She will always fetch to windward of Madraſs; becauſe ſhe will not get into the SW. winds and Northerly currents 'till near the land; but ſhips that ſail later, or even at that ſeaſon, if bound more Southerly, ought to ſee Zeloan, and from thence coaſting (not too near Point Pedro) may croſs the gut to Negapatam, and viſit every other port on the coaſt. Sometimes ſqualls (uſually light) with thunder and rain, happen in this paſſage, eſpecially near Zeloan; which is of great advantage to late ſhips, in this calm ſeaſon: they ought to be very careful, when the weather is fair, and the breezes variable, to carry what ſmall ſails they

can muſter, and trim to every breeze that offers; which is too often neglected, eſpecially in large ſhips.

By following this method of navigation, and thoſe hereafter mentioned, from Madraſs, ſome (even though heavy-ſailing) ſhips make annually 3 voyages from Bengal to Madraſs, and back again: and many ſeamen think that a good-ſailing ſhip, well fitted, and diſpatched quickly, from each place, may make 4; but by the neglect of this management, many ſhips either loſe, or greatly prolong their paſſage.

Three Europe ſhips left the Pilot ſome time in April, 1758, and were 3 months going to Madraſs. A poor country ſhip ſailed ſeveral days after them, and got there in 30 days. Whoever compares their journals with what is written above, will eaſily ſee in what they erred.

From Bengal to Surat, Bombay, &c.

Auguſt and October. Ships that leave Bengal between Auguſt 15, and October 10, for Surat, muſt work cloſe along the ſhores of Orixa, Galconda, and Coromandel, to Madraſs or Pondicherry, as is already directed, page 14; and from thence (as the winds are uſually variable in October) ſteer over for Zeloan, taking care not to go too far from the ſhore, for fear of loſing the current; except it is late in October, or the winds hang eaſterly: in either of theſe caſes it will be beſt to ſtand off ſhore, for fear of being entangled in the bite; and come no nearer Zeloan than 10 to 20 leagues, 'till about the latitude 7° 20′ or 7°, where it is proper to ſee it, becauſe the current runs ſwiftly round the iſlands; and from thence (having coaſted round the Baſſes) keep pretty near the ſhore, 'till you ſee Columbo; and then ſtand off for Cape Comorin. The winds and weather in October, round the South ſide of Zeloan, are unſettled: ſometimes there are hard ſqualls from the land; at others much calm, or trifling, and even freſh winds from the ſea, with ſqualls and rain: the ſqualls always give warning; and it is proper, at this ſeaſon, for ſhips to anchor when they ſee them coming off ſhore, to avoid being driven from the iſland: the ſame ought to be done in calms when the current ſets off ſhore.

By neglecting this caution, captain Pearſe, in the Sarum, was driven among the Maldives, in 1738.

If ſhips, at this ſeaſon, having coaſted round Zeloan, ſo far as Barbarine Iſland, are taken with a briſk gale from the Northward, it is beſt to ſtand over, cloſe hauled, for Cape Comorin, and not loſe time in working up to Columbo; but Barbarine Iſland ſhould bear Eaſt before you quit Zeloan. In croſſing Tutacareen Bay, the winds will now be found variable, ſometimes freſh, and often faint; but a ſhip having reached Cape Comorin about the middle of November, will have fine land and ſea breezes to work along ſhore, quite to Surat. Thoſe land and ſea breezes ſometimes blow off and on ſhore about WSW. and ENE.: but this is ſeldom; for the wind generally comes off in the night, at NE. NNE. and perhaps N. and the ſea winds come in the forenoon, at W. WNW. and NW. a ſhort calm uſually, though not always, intervening: ſhe muſt therefore edge ſo far off ſhore, with the land wind, that the ſea breeze may bring her in again to ſtretch off with the firſt of the next land wind: this will commonly be done by ſteering with the land breezes NWbN. NW. NWbW. or for an hour or two WNW.; and with the ſea breezes NbW. N. NbE. and NNE. according to the diſtance off ſhore, and as theſe breezes are more or leſs Northerly, and of ſhort or long continuance. By this management a ſhip makes all poſſible advantage, on each tack, that can be made, and often ſaves the trouble of anchoring; whereas if ſhe has not ſufficient offing when the ſea winds begin, ſhe will be in with the land, and obliged to anchor before it is half done; by this means a fine ſtretch of 8 or 10 miles to the NbW. and N. will perhaps be loſt: on the other hand, if ſhe ſtands too far off ſhore, the ſea breeze will fail perhaps before ſhe is within 6 or 8 miles of the land; in ſuch caſe, a good part of the land winds will be done before it reaches her: beſides, if it falls calm,

and

and the ſwell or current ſets to the Southward, ſhe muſt anchor in deep water; therefore the direction and ſtrength of thoſe land and ſea winds, both ſubject to great variation, will daily inſtruct a diligent obſerver, how far he ſhould ſtand off ſhore, and when he ought to anchor; or, if the inequality of thoſe winds ſometimes hinders him from making the moſt of them, the loſs will be ſmall, and the error one day rectified the next, either by anchoring between the breezes, or ſteering, more or leſs, off or towards the land, or going a greater or leſſer diſtance from the ſhore, as the caſe ſhall require.

Between the middle of October and the middle of December, ſhips will commonly find light or moderate gales, juſt after leaving the Pilot; and, as they go to the Southward, they will uſually have freſh gales NEaſterly, with ſqualls and cloudy weather, eſpecially drawing near Zeloan: and as the current then runs ſtrong to the Weſtward, her beſt courſe, for ſome days, is SbE. then S. SbW. SW. &c. ſo as to make Zeloan in the latitude of 7° or 7° 20′ N. The current renders the difference of longitude very precarious; therefore, when ſhe comes into the latitude of 8° 20′ N. ſhe ought to run Weſt all day (looking well out for the land at maſt-head) SWbS. or SSW. in the night, carrying an eaſy ſail, heaving the lead every 2 miles run, and keep a good look-out; but if the land is ſeen Northward of 7° 30′ N. ſhe ought to haul off, for fear of being entangled with a lee ſhore. *October and December.*

By not following theſe cautions, many ſhips have been loſt.

About December, 1734, captain Tolſon, in the Heathcote Indiaman, bound from Bengal to Bombay, by ſteering SSW. from the Pilot, run a-ground in the night, on the ſand near Point Pedro: the people were about quitting her in the long-boat, when they found the ſea had beat her over the bank into deep and ſmooth water. An anchor was immediately let go, and by that means the ſhip was ſaved.

A year or two afterwards, captain Montgomery, in the Defence Indiaman, going the ſame voyage, at the ſame ſeaſon, found himſelf, unexpectedly, cloſe to Zeloan: he immediately hauled to the South-Eaſtward, and the ſhip ſtruck thrice on the South end of the bank near Batacoola; yet having freſh way, ſhe quickly got into deep water, and was ſaved.

Captain Sutcliffe, in the Richmond, bound from Bengal to Buſſorah, left the Pilot, 1736, ſteered SbE. S. SW. &c. and being at noon in latitude 8° N. ſteered Weſt to make the land, but at ſun-ſet could not ſee any; however, he ordered the ſame courſe to be continued 'till midnight, and then to haul up SSW.; but at 10 P. M. they ſaw the low land, and breakers right a-head; immediately they hauled their wind SEbS. (the wind being at EbN. with a large ſea) and by carrying a preſſed ſail, juſt cleared the ſhore. In this run, it is remarkable, that neither the captain nor the officers, by the log, made above 2° 30′ meridian diſtance, Weſt from Point Palmiras, when they ſaw the breakers, though the uſual Weſting to the Eaſt ſide of Zeloan is 4 to 5°; nor were they more than 7 days from the Pilot; which ſufficiently ſhews how ſtrong the current runs Weſtward in this month.

A fine ſhip, bound to Surat, belonging to Mr. Williamſon, was loſt near Batacoola, by the captain's obſtinately running directly in with Zeloan, in the night, December, 1754. Captain Richards alſo loſt the Eagle, and his life, by neglecting his lead, and running in with Zeloan, in the day time, but thick weather. The Indiana was very near ſharing the ſame fate, at the ſame time.

March 3, 1754, the Succeſs galley, captain Duncan, bound to Surat, left the Pilot, when Point Palmiras was judged to bear WSW. 12 leagues diſtance, with light, but moſtly fair winds. She ſtood out S. to SbE. for 3 days, and for 5 days more ſtood, cloſe hauled, to the SE. having the wind between the South and Weſt, but moſtly from SWbS. to SWbW. She was that day (March 10) at noon, in latitude 13° 36′ N.; and 2° 25′ meridian diſtance Eaſt from Point Palmiras. Next day, with variable light winds, ſhe ſailed SbE¼E. 34 miles, and at noon was in 12° 56′ N. latitude, and 2° 33′ Eaſt, meridian diſtance, when a briſk breeze

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ſprung up at NNE. with which ſhe run 134 miles SbW. in 28 hours; and in 20 hours more 135 miles, when her latitude at noon (March 13) was 8° 50′ N. and meridian diſtance 1° 16′ Eaſt. Next day, with a freſh gale at NE. ſome ſqualls and rain, ſhe run S51°W. 154 miles; her latitude was then 6° 53′ N. meridian diſtance 0° 26′ W. from Point Palmiras. March 15, with the ſame winds and weather, ſhe ran S77°W. 108 miles, and found a Northerly current of 21 miles; her latitude was 6° 50′ meridian diſtance 2° 12′ W. Next day had leſs wind from the ſame quarter, and ran 95 miles S74°W. and found only 5 miles Northerly current; her latitude being 6° 30′ N. meridian diſtance 3° 42′ W. from Point Palmiras. The 3d day following, with unſettled weather, much rain, and variable light winds, chiefly from NNW. ſhe ſteered to the Weſtward; ſo that the 19th, at noon, her latitude obſerved was 6° 00′ N. and meridian diſtance 5° 23′ W. From this, ſteered about NW. 6 miles, and ſaw the Elephant on Zeloan bearing NWbN. 7 leagues off: at the ſame time had a ſmall current to the SWeſtward. March 20 and 21, ſhe coaſted (with fine land and ſea breezes from NE. to SEbS.) round to Point Gaula: and the laſt of thoſe days, at noon, that town bore NbE½E. 7 leagues off. From thence, with a fine gale at SE. ſhe ſtood over for Cape Comorin, N49°W. 78 miles. On the 22d, and the next day, the wind veered to WbS. SWbW. and SW. with which, cloſe hauled, ſhe made her courſe N40°W. diſtance 63 miles. The 24th ſhe continued the ſame courſe with the ſame winds, 'till midnight, when they had 25 F. and were then, by account, in latitude 8° 00′ N. meridian diſtance 2° 13′ W. from Gaula Town. She continued to ſteer NWbW. 9 miles further, when being in 12 fathoms at 5 A. M. ſtood off SbE. 4½ miles: they were then about 7 miles off ſhore, and ſaw the cape, bearing WbS. a great way off; and were plagued 3 days before they got round it. Being paſt Comorin, ſhe had land and ſea breezes, with which they reached Cochin in 3 days, where, having filled her water, &c. April 7, ſhe ſailed for Surat. For 6 days ſhe had briſk breezes, between WSW. SWbW. and SW. and ſometimes to NW. NNW. N. and NbE; ſo that her latitude was 10° N. meridian diſtance 3° 41′ W. from Cochin. The 14th, after running 8 miles SW. from this point, ſhe ſaw the 2 ſmall iſlands, called in the New Directory Scuhelipar, to the WNW. 3 leagues off; which, by this account, lie 3° 55′ W. from Cochin, and in latitude 10° N. This day ſhe had light trifling winds, with ſome ſqualls and rain, that ended with fine light breezes from SE. with which ſhe ran, 2 days, nearly NWbW. and was then (the 16th at noon) in 11° 14′ N. latitude, and 5° 57′ W. from Cochin. The next day ſhe had light winds from SSW. to N. with which ſhe made her courſe N40°W. diſtance 38 miles. The 18th ſhe ſailed, ſometimes on one tack, and ſometimes on the other, ſo as to make her courſe N41°W. diſtance 21 miles; the winds light and variable. The 19th, ſhe had for 5 hours, a briſk breeze, at NEbN. and the other part of the day, light winds from NW. to N. ſteered as yeſterday, ſometimes NWbN. to NNE. at others WSW. to WNW. courſe N 50° W. diſtance 49 miles, latitude obſerved at noon 12° 19′ N. meridian diſtance 7° 14′ W. The 20th and 21ſt, ſteady breezes at N. to NNW. ſtood cloſe hauled, W. and WNW. and the 21ſt, at noon, was by obſervation in 12° 21′ N. and 9° 28′ W. of Cochin: laid her head to the NEaſtward, with the wind NNW. (ſometimes NWbN.) ſtood NE½E. to NEbN.; ſo that the 23d, at noon, was in 13° 46′ N. latitude, meridian diſtance 7° 49′ W. The 24th, the winds more Weſterly, viz. NWbN. to NW. and NWbW. ſtood as before, cloſe hauled, NE½N. to NbE. latitude at noon 14° 56′ N. meridian diſtance 7° 15′ W. The 25th, the winds ſtill more Weſterly, viz. NW. NWbW. and WNW. ſtood 18 hours NNE½E. to N. and to chaſe a galley, not 6 hours WSW. to SW½W.; latitude at noon 15° 34′ N. meridian diſtance 7° 8′ W. The 26th and 27th, ſteady breezes from NW. to WNW.; ſtood ſometimes on one tack, and ſometimes on the other; ſo that the 27th, at noon, her latitude was, as before, 15° 34′ N. meridian diſtance 8° 8′ W. The 28th and 29th, variable faint breezes and calms: the 29th at noon, latitude obſerved 16° 30′ N. meridian diſtance 8° 17′ W. The 30th, and May 1ſt, a

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fine breeze at W. and SW. (chiefly SW.) ſteered N.; and the 1ſt at noon, was in 18° 44′ N. meridian diſtance 8° 17′ W. May 2, ſteady breezes from SSW. to WNW.; ſteered the firſt 6 hours NbE. then 12 hours NNE. and the laſt 6 hours NE.; direct courſe N 27° E. diſtance 82 miles, latitude obſerved 19° 45′ N. meridian diſtance 7° 40′ W. The 3d, ſteady breezes from WNW. to WSW.; ſteered firſt 24 miles NE. (in 7 hours) then 21 miles ENE. (in 5 hours) and had ſoundings 30 fathoms grey ſand: this was midnight, and ſhe continued her courſe 'till noon between E. and ENE. latitude obſerved 20° 15′ N. meridian diſtance 6° 23′ W.; the depth increaſed to 42 fathoms. Next day, with a freſh breeze at WSW. ſhe ſteered between ENE. and ESE. (having no leſs than 17 fathoms ſoft ground) ſo as to make at noon her courſe E. diſtance 85 miles, latitude obſerved 20° 15′ N. meridian diſtance 4° 58′ W.; the high land of St. John's bore then EbS. diſtance 9 leagues. The gale continued freſh from the Weſtward, and run her to Surat Road next day, viz. May 5, 1754.

The ſame ſhip (i. e. the Succeſs galley) bound to the ſame port, under the command of the ſame perſon, left the pilot, next year, March 6, and being in 20 fathoms water, Point Palmiras WbS. 20 leagues off, with freſh gales from SSW. to WSW. run, cloſe hauled, to the SEward; ſo that, on the 8th at noon, her latitude obſerved was 17° N. meridian diſtance from Point Palmiras $2\frac{1}{2}$° Eaſtward. The winds became now more moderate, and the water ſmooth; ſo that the next 2 days ſhe ſteered S. 187 miles, with fine light breezes between WbS. and SW.; the latitude obſerved at noon (the 10th) being 13° 44′, and meridian diſtance $2\frac{1}{2}$° Eaſtward. The wind now veered to NbE. and continued to blow, between that and Eaſt, a fine gentle breeze, and pleaſant weather for 11 days, with which the ſhip went as follows; viz. March 11, S5°W. 75 miles, latitude obſerved 12° 26′ N. meridian diſtance 2° 24′E. The 12th, S17°W. 63 miles, latitude obſerved 11° 26′ N. meridian diſtance 2° 6′ E. The 13th, S28°W. 62 miles, latitude obſerved 10° 30′ N. meridian diſtance 1° 37′ E. The 14th, SW. 66 miles, latitude obſerved 9° 46′ N. meridian diſtance 50′ E. The 15th, S53°W. 65 miles, latitude obſerved 9° 06′ N. meridian diſtance 0° 02′ W. The 16th, S48°W. 48 miles, latitude obſerved 8° 31′ N. meridian diſtance 38′ W. The 17th, SW. 48 miles, latitude obſerved 8° 04′, (which is 7 miles Northward of account) meridian diſtance 1° 12′ W. The 18th, SW. 100 miles, latitude obſerved 7° 12′ N. (which is 19 miles Northward of account) meridian diſtance 2° 23′ W. The 19th, SW$\frac{1}{2}$W. 97 miles, latitude obſerved 6° 24′ N. (which is 13 miles Northward of account) meridian diſtance 3° 38′ W. The 20th, ſteered W. all the day, and SW. in the night, her true courſe S70°W. diſtance 90 miles, latitude obſerved 5°47′ N. (which is 6 miles Northward of account) meridian diſtance 5° 02′ W. The 21ſt, ſhe ran the firſt 3 hours WNW. 19 miles; and then ſaw Zeloan bearing NbW. continued the ſame courſe 192 miles more, 'till ſun-riſe; when ſhe ran WbS. 8 miles, and W. 43 miles; then ſaw Adam's Peek, NNE. off ſhore 4 leagues. Point Gaula was then judged to bear ENE. 6 leagues off. She ſteered Weſtward 'till noon, and then was, by obſervation, in 5° 56′ N. meridian diſtance from Point Gaula 35′ W. With this day the NE. winds ended. The next 4 days ſhe had, as before, fine ſerene weather, and very light breezes, chiefly from SEbE. to SW. ſometimes WSW. with which ſhe ſteered NWbW. and NW.; ſo that the 25th at noon, her latitude obſerved was 7° 27′ N. meridian diſtance from Gaula 3° 06′ Weſtward. The 26th, the wind veered to WbS. W. WNW. and NW. with which ſhe ſteered 13 hours, cloſe hauled, 37 miles, NWbN. NNW. N. and NNE. and then (at 1 A.M.) ſaw the land a-head, in depth 18 fathoms, coarſe ſand and ſhells: ſhe then tacked, and loſt 2 days in working round the cape. From March 28, (when ſhe paſſed Cape Comorin) to April 11, was pleaſant weather, with ſmooth water, and variable light breezes, moſtly from NNW. to W. and once or twice a faint land breeze: with theſe ſhe worked along ſhore, often anchoring; becauſe off ſhore there was uſually a current of $\frac{1}{2}$ to 1 mile an hour to the SSE. and SE. which obliged

her to anchor in deep water, if it fell calm, or to loſe ground: for this reaſon alſo ſhe avoided going too far off ſhore. She anchored one day at Cochin, another at Tillecherry; and April 11, was off Mount Dilla. The 2 next days ſhe made but little way, being ſqually weather with much thunder, lightening, and rain; ſo that the 15th, at noon, her latitude obſerved was only 12° 17′ N. Mount Dilla then bearing SE½S.; off ſhore 4 leagues. From this day, 'till ſhe reached Surat, ſhe had ſmooth water and pleaſant weather, with which ſhe ſteered as follows, (viz.) April 14, with a fine gale at SSE. to S. ſhe ran 121 miles NNW. and NW. and at noon was in 40 fathoms water, latitude obſerved 13° 37′ N. about 10 leagues WSW. from Baſalore: and as Angria's fleet made it dangerous to paſs further along ſhore, ſhe put off, April 15, with moſtly WSW. to SWbW. winds; ſhe made her courſe N 50°W. diſtance 47 miles, latitude obſerved 14° 14′ N. meridian diſtance 1° 04′ W. from Baſalore. The 16th, with ſteady breezes at NWbN. to WbN. ſteered, cloſe hauled, WbS. to SWbW. all day, except 3 hours that ſhe ſtood NbW. and N. and made her courſe good, S69°W. diſtance 56 miles, latitude obſerved 13° 54′ N. meridian diſtance 1° 56′ W. The 17th, briſk breezes at NWbN. to N. ran, cloſe hauled, WbN. to WNW. and made the courſe W. diſtance 83 miles, meridian diſtance 3° 19′ W. and latitude obſerved 13° 37′ N. (which was 17 miles to the Southward of account). The 18th, briſk breezes, at NbW. to NW. ſteered, cloſe hauled, as yeſterday, and made her courſe S80°W. diſtance 30 miles, latitude obſerved 13° 07′ N. (which is 14 miles Southward of account) meridian diſtance 4° 51′ W. The 19th, ſhe ſtood ſtill to the Weſtward, with more moderate breezes at N. to NW. and made her courſe N85°W. diſtance 49 miles, latitude obſerved 13° 07′ N. (which is only 5 miles Southward of account) meridian diſtance 5° 50′ Weſtward of Baſalore. The firſt part of the 20th, with light winds from NbE. to NbW. ſhe ſteered NWbW. to WbN. 39 miles, then NNE. to NE. 17 miles, the wind at NWbN. and NNW. at noon her true courſe was N44°W. diſtance 36 miles, latitude obſerved 13° 19′ N. (which was again 14 miles to the Southward of account) meridian diſtance 6° 15′ W. of Baſalore. The next 4 days, with moderate breezes between NNW. and W. (chiefly NWbW. to WbN.) ſhe ſtood, cloſe hauled, NEbN. to NNW. and the 24th, at noon, was 5° 12′ W. meridian diſtance from Baſalore, latitude obſerved 17° 50′ N. She then edged away, (having much the ſame wind, but freſher,) all the 25th, NNE½E. 100 miles. The 26th, from midnight 'till noon, ſteered NEbE. 64 miles; her meridian diſtance was then 5° 52′ W. from Baſalore, latitude obſerved 20° 09′ N. depth 20 fathoms mud. Not ſeeing the land that night, they ſteered 'till 10 P.M. EbN. to ENE. 45 miles; in depths 18½, 17, 17, 16, 16, 16½, 18 fathoms; from 10 to 11, P.M. run 7 miles EbN. and deepened to 20 fathoms; hauled up NE. 7 miles 'till midnight, and then NEbN. 19 miles, till ſun-riſe; when ſhe was in 13 fathoms, and ſaw the land from maſt-head, about ESE. At 8 A.M. ſhe anchored during the laſt quarter ebb, that runs 3 knots; and in the afternoon ran up to Surat Road. But to return from theſe examples to the inſtructions.

A ſhip having reached Zeloan, ought to coaſt round it, at a moderate diſtance, to Point Gaula: ſhe will have no occaſion to anchor, there being now no land ſqualls or calms but a briſk gale and ſtrong current from the Eaſtward. About Point Gaula the gale will begin to fail; ſhe ought therefore to keep nearer ſhore, and avoid opening Tutacareen Bay 'till as high as Barbarine Iſland, and from thence ſtand over, cloſe hauled, for Cape Comorin. Ships, at this ſeaſon, will commonly have fair weather, and a freſh gale, between N. and NEbN.: but if this gale prevent your getting quite ſo high as Barbarine, it is generally better to ſtand over, than loſe in working along ſhore.

From Cape Comorin, ſhips ought to work up the coaſt with land and ſea breezes, as is already directed: but if theſe breezes are intercepted by a briſk gale from NNW. to NW. (which ſometimes happens in December for 3 or 4 days) they ſhould turn to windward, or (if nothing can be gained that way) anchor 'till the gale ceaſes. Ship

Ships leaving Bengal between the middle of December and latter end of January, will uſually find much leſs current, and fairer weather, with ſteady but more moderate gales, from the NE. than the preceding month; therefore a SbW. courſe, from the pilot, is now beſt for ſome days, then SSW. &c. going almoſt in a right line for that part of the bay in latitude 7° 30′ N. and 20 or 25 leagues Eaſtward of Zeloan. From thence they ought to ſteer W. &c. as already directed, page 19, and make the Iſland about Julius Nave, or in latitude 7° 00′; the weather will then be fine, and the wind fair, with which they ſhould coaſt round to Point Gaula, and having brought that point Eaſtward, ſtretch over to Cape Comorin, with a moderate, perhaps a briſk gale from N. to NEbN. which is uſual at this ſeaſon. *December and January.*

The directions to navigate from Bengal to the Coromandel Coaſt, in February and March, is pretty ſufficient, with regard to the Bay of Bengal: let it be further obſerved, that the meridian of Point Palmiras ſhould not be paſſed 'till in the latitude of 10° N. but if, at leaving the pilot, ſhe is forced, by the uſual SW. winds, to the SE. when a fair wind comes, let her ſhape her courſe for that point that lies South of Point Palmiras, in the latitude of 10°, or 9° 30′ N. and from thence ſteer SW. SWbW. and WSW. for the South ſide of Zeloan, between the Elephant and Dundra-head: and as no time ſhould be loſt, let her not ſhorten ſail; but when in the latitude 7°, or 6° 30′ N. ſteer about Weſt in the day, and SW. all night: this perhaps may carry her into 5° 30′ N. but it matters not, ſhe will have the better wind for it; and when her Weſting is run down, (which is about 5 ½° from Point Palmiras to the Elephant,) a WNW. or NWbW. courſe will always bring her in with the iſland; becauſe to the Southward of 8° N. and about 2° Weſtward of Point Palmiras, ſhips uſually find a Northerly current of 10 to 20 miles a day: this is what runs along the NE. ſide of Zeloan, and requires 2 or 3 days to croſs it. When Zeloan is plainly ſeen, it is proper to keep 7 or 8 leagues off ſhore; becauſe near Point Gaula a briſk gale from SW. often begins, with which ſhips ſtretch over to Cape Comorin, and ſometimes not able to weather it, which cauſes a loſs of 2 or 3 days to work round. *February and March*

From Cape Comorin, ſhe muſt work along ſhore as well as ſhe can, 'till it happens to blow freſh down the coaſt: it is then beſt to ſtand off ſhore (as if bound to Perſia) through the Laccadives; but this ought not to be attempted 'till in the latitude of 10° N. for fear of being driven, by the Southerly current, among the Maldives: ſo that, ſhould weak land and ſea breezes, moderate variable winds, or Southerly winds prevail, her beſt way is to keep along ſhore, and not ſtand off 'till ſhe can gain nothing; and that perhaps may be in 14 or 15° N. She need not ſtand to the Weſtward, ſo far as ſhips bound to Perſia, for her buſineſs is chiefly to the Northward; and as ſhe gets Northing, the wind will commonly veer to the Weſtward, and drawing near St. John's, it will come to WSW. and SW. The following abſtracts of two pretty well conducted voyages, at this ſeaſon, will ſet the whole in a clear light: only let it be obſerved, that both voyages, captain Duncan took too wide a range in the bay; for the 1ſt voyage, when the wind comes NNE. being (March 10, at noon) in the latitude of 12° 56′ N: meridian diſtance 2° 33′ E. from Point Palmiras, and in order to bring that point North, in the latitude of 10°, inſtead of ſteering SbW. and SSW. he ought to have ſteered , and then for Zeloan, as above directed.

The 2d voyage he took leſs range, but ſtill too much; for the track preſcribed is beſt. Both voyages he kept too near Point Gaula, and thereby loſt 2 days each voyage in doubling Cape Comorin. It is true, his nearneſs to Zeloan could not be detrimental, if at leaving it with the wind at SE. March 22, 1754, and March 22 and 23, 1755, he had ſteered Weſt for ſome time, then WbN. &c. ſo as to be ſure of weathering the cape: but no perſon ought to truſt to that; becauſe ſometimes the wind ſets in freſh from SW. earlier than the latter end of March.

The

The latter end of February, 1747, captain Rannie, in the ſhip Fanny, bound to Surat, had the hay-cock over Point Gaula bearing North, off ſhore 10 leagues; when the wind ſet in freſh at SW. to WSW. with which ſhe carried a preſſed ſail a-croſs the bay, in order to weather the cape; but could not fetch it by 10 leagues, and was 3 days in going round it after making the land.

Here ſhould be inſerted an abſtract of captain Taylor's journal, who left Bengal the 31ſt of March, 1748, and anchored at Fort St. David's the 26th of April; as alſo of his other journal, when he left Bengal the 3d of April, 1756, and anchored at Nagore the 19th of May. If they can be procured againſt another edition of this work, they ſhall be inſerted; and any gentleman who can aſſiſt me in procuring the originals, or good copies thereof, the favour ſhall be gratefully acknowledged.

To conclude this head, let it be remembered, that ſhips bound to Surat, who leave Bengal a little later than the Succeſs did, run the riſque of loſing their paſſage.

The Leſlie loſt her paſſage round Zeloan, March 17; and the Two Brothers, to the Maldives, who left the pilot March 23, NS. 1739. Captain Riccards, in the Ann, loſt her paſſage round Zeloan the ſame year, by falling in with Batacoola.

From the Coromandel Coaſt to Bengal.

January and February. Between the 10th of January and 1ſt of February, the current commonly begins to creep to the Northward, cloſe to the ſhores of Coromandel; the rains are then done, and the weather grows mild and fair; the NE. winds, that have blown ſtrong near 3 months, are now moderate, or perhaps land and ſea breezes, from ENE. to WNW. prevail. Ships bound to Bengal from Madraſs, Pondicherry, &c. ought now to work cloſe along ſhore, to the Northward, in the ſame manner as they are directed to the Southward, in the month of Auguſt, when bound from Bengal to this coaſt: they ought likewiſe to be careful not to go any diſtance from the ſhore; becauſe whoever does ſo, inſtead of a Northerly current, with land and ſea breezes, will probably get into calms, and a Southerly current; nor ought they now, or in Auguſt, to be afraid of the ſhore, but work near, and keep the lead going, and a ſhip ready to ſtay.

The current has not, for many years, changed, in Madraſs Road, ſooner than December 30, OS. and that happened 1745, when governor Morſe diſpatched the Exeter, captain Weſton, for Bengal; and a few days afterwards, the Falmouth, captain Field: both got their paſſages in 12 to 15 days; did all their buſineſs in Bengal, and were diſpatched to Europe in March; but neglecting to heave the lead, the Falmouth was almoſt a-ſhore on Due Point. On the other hand, it has been known not to change 'till the latter end of January; and the Britannia, captain Sumner, ſailed out of Madraſs Road January 8, OS. 1751, and could not get above where ſhe anchored in 6 days, and then returned to the road, and waited 'till the current changed, which happened that ſeaſon to be about January 25, OS.

March and April. In March and April, ſhips bound to Bengal are generally ſure of either land or ſea breezes, or Southerly winds; their beſt way is therefore to work as above, only it is not ſo neceſſary to keep cloſe to the ſhore 'till paſt Vizagapatam; however, even now, by keeping near the ſhore, the paſſage will be got ſooner.

May, June July, and Auguſt. During the next 4 months, ſhips generally find freſh gales from the SW. quarter, with cloudy weather; and along the coaſt of Galconda, Orixa, and Bengal, frequent ſqualls with rain. Their beſt courſe from Madraſs Road is NE. 'till near the latitude of 16° N. then NEbN. or NNE. in the day, and NE. in the night, which will commonly bring them in with the land about Pondy or Barras: but if it does not, they ought immediately to haul up NbE. N. or Nb.W. in order to reach the ſhore; becauſe there are inſtances of ſhips that have ſtood as above, 'till in the latitude of Vizagapatam, and from thence NNE. and NbW.

night

night and day, yet have only fetched in with the Falſe Point, and been puzzled to know whether it was the Falſe or True Point: which in the night eſpecially is eſſentially neceſſary. Ships may ſteer in ſhore with any part of the land from Negapatam to Balaſore, provided they heave the lead every 1½ or 2 miles run; for there is not ſo much as 30 fathoms, 3 miles off ſhore, any where all along the coaſt, except on the Eaſt ſide of the Armagon. When ſhips run directly in with that ſand, the lead ſhould be heaved every ½ mile they run. Being got in with any part of the high land, they ought to ſteer along ſhore NE. and NEbE. in 25 to 30 fathoms water, keeping the lead going. When they draw near Manackapatam, the water will ſhoal, and they muſt haul more to the Eaſtward; becauſe, on that coaſt, the land ſtretches ſo. Let them paſs Manackapatam in 15 to 16 fathoms, then ſteer in 12 to 14 F. 'till paſt the Black Pagoda; and then in about 17 to 18 fathoms, to the Falſe Point; from the Falſe Point to the True Point, in 15 and 17 fathoms, are the beſt depths; and not leſs than 13, nor above 16 fathoms, is the proper track to round Point Palmiras. As ſoon as a ſhip, in 14 to 15 fathoms, has got ſoundings upon the hard ſand off Point Palmiras, ſhe ought to ſteer North about 15 leagues, and then NNW. and NWbN. and NW. 'till in 9 fathoms, where the pilot ſloops uſually lie at anchor.

Captain James Sterling, in the ſhip Jenny, from Bombay, June, 1738, anchored in the evening between the points, being afraid to round Point Palmiras in the night. In June or July, 1737, the Europe ſhip, Devonſhire, captain Prince, and Leſlie, captain Acton, coming from Madraſs to Bengal, were ſo much afraid of the land, that they kept off in deep water; this carried them without the hard ſoundings that lie off both points; and they were in ſhoal water among the ſands, about Sagor, before they thought of hauling up for Balaſore Road. The ſhoals, ſoundings, and their quadrants, ſhewed their error; and after fatiguing their people, and tearing their ſhips, ſails, and rigging, to pieces, in working againſt the monſoon (in ſtrong gales, a great ſea, many ſqualls, and rain) commonly under double and treble reefed topſails, for a fortnight, they reached Balaſore Road; but, had any accident happened to their lower maſts, they would probably never have been heard of; for, though the Aracan and Chatigan are rivers to the leeward, yet that coaſt cannot be approached at this ſeaſon, without extreme danger, eſpecially by ſhips in diſtreſs.

Here ſhould be inſerted the caſe of the Elizabeth Indiaman, July, 1749; that of the Two Brothers in July, 1739; with Mr. Miller the pilot's miſtake about the points, &c. extracts of captain Duncan's journal, viz. January 10, at noon, and moſt part of next day, 1754; June 18 and 19, 1756; June 8 and 9, 1755; March 10 and 11, 1756. The editor of this work will be greatly obliged to any gentleman, who may be poſſeſſed of the originals or copies of the above caſes, &c. and will be ſo kind as to communicate them to him, in order to their being inſerted in a future edition.

Though no deſcription of the coaſt is intended, yet the many difficulties and blunders that are made in the navigation, make ſome remarks proper in this place.

Firſt then, from Vizagapatam to Manackapatam the land is moſtly high, and the ſhore lies NE. and NEbE. From Manackapatam to the Black Pagoda the land is low, and nothing remarkable upon it, but Jackernaut and this Black Pagoda: the coaſt ſtretches ENE. and EbN.; but from the Black Pagoda, quite round Palmiras to Canacka Bay, the land is ſo very low, that no mark can be ſeen to aſcertain where a ſhip is; except ſome ſcattered trees, and low ſandy hillocks, that may be ſeen in fair weather; but are then only known to good pilots, and people who have long frequented the trade. The ſhore lies NEbE. and NE.

Next, from Manackapatam to near the Black Pagoda, there is (along ſhore) a flat, hard ſand (chiefly brown) that reaches from the beach to 14 fathoms water: further off this, ſoft ground, mixed with ſand; and without that is all ſoft ground. From the Black Pagoda to

the Falſe Point, and from thence to Point Palmiras, the ground is hard ſand, from the beach to 7 or 8 fathoms water; further off is ſoft ground, in ſome places black, in others greeniſh, often mixed with dark-coloured ſand, and a few broken ſhells. The hard flat ſands, that run out from Point Palmiras and the Falſe Point, are too ſimilar to be diſtinguiſhed by their ſoundings, (or any other good mark) for each has much the ſame depth, at the ſame diſtance from the ſhore; each has various coloured ſand (chiefly brown) with ſtones and ſhells, &c. and each ſtretches a great way into the ſea; that off Point Palmiras into 21 and 22 fathoms; that off the Falſe Point, into 18 or 19; but in thoſe depths, the ſpits being very narrow are quickly paſt, and often without being felt by the lead: from all which it follows, that, in order to avoid bad conſequences of miſtaking one point for the other, (which is either being embayed between them, or running paſt Balaſore, among the Eaſtern ſands) a ſhip's only guidance is the latitude obſerved, diſtance run, and the ſoundings: Now an obſervation is often not to be had; and the diſtance run, if ſhe has been long from ſeeing any known land, very precarious, on account of currents: ſhe ought therefore to endeavour ſeeing Jackernaut, or the Black Pagoda; and for that purpoſe keep well in upon the ſand that lies at a good diſtance from the ſhore, near Jackernaut, in from 11 to 13 fathoms water: ſhe will not then paſs it unſeen, even if the weather ſhould be a little hazey; and her diſtance from thence to the Falſe Point is too ſmall to admit any conſiderable error, if the log is well attended to; conſequently, both her diſtance run, from ſeeing the Pagoda, and the hard ſand ſoundings off the Falſe Point, will aſcertain where ſhe is; and ſhe may boldly ſtand on NEbE. and NE. to Point Palmiras: but if, after ſeeing the high land, bad weather, or the night, prevents her ſeeing the Pagodas, let her, when thought near Jackernaut, take care to be in 13 or 14 fathoms. The ſhore ſtretching well to the Eaſtward, will make her ſteer ENE. to EbN. perhaps E.: upon theſe courſes ſhe will, when paſt the Pagodas, loſe the hard ground, and deepen the water to 16 and 17 fathoms; let her then ſteer NEbE. and NE. and that will carry her along in 16 and 17 F. or at moſt 18 F. (without which ſhe ought not to go) and when within about a mile of the ſand off the Falſe Point, the water will perhaps deepen 1 or 1½ fathom; but ſhe, continuing her NE. courſe, will quickly ſhoal it again to what it was before, or perhaps have a fathom or two leſs, hard ſand, which is the ſoundings off the Falſe Point: from thence ſtill continue her courſe about NEbE. in 15 to 17 fathoms, and that will certainly bring her on the hard brown ſand off Point Palmiras, in 14 to 16 fathoms: let her, when ſhe finds this hard brown ſand, immediatly ſteer North, &c. as above directed, page 25. For further particulars ſee the New Directory, p. 42—45, and 134—136.

Should a ſhip, by misfortune, or otherways, ſee no land after leaving Madraſs, have no obſervation, nor reckoning, that can be depended on, and is only ſure of being ſomewhere between Point Palmiras and Ganjam (called Carepave in the Coaſting Pilot), even then ſhe may go to Balaſore, with the greateſt ſafety, by her lead; for ſuppoſe ſuch a ſhip is, at this ſeaſon, ſtanding in for the land NW. with thick weather, and a freſh gale from the Southward, and in the evening ſtrikes ground 25 or 30 fathoms; let her ſtand on NW. without fear (heaving the lead briſkly, and getting all ready for veering) 'till in 17 or 18 fathoms, then veer round, and ſteer NEbE.: if upon this courſe the water ſhoals pretty quickly, let her ſtand on to 16, 15, 14, and 13 fathoms; which laſt will be hard ſand, and plainly ſhews the ſhip to be between Manackapatam and the Black Pagoda: ſhe muſt then haul off EbN. and E. 'till the water deepens to 16 fathoms; whence ſteering as above directed, ſhe will find the ſoundings off the Falſe Point, and afterwards of the True Point: but if ſteering NEbE. in 16 and 17 fathoms, carries her along in much the ſame depth, ſoft ground or mud and ſand, ſhe is either between the Black Pagoda and Falſe Point, or between the True and Falſe Point; let her therefore continue ſteering NEbE an

and NE. in 15 to 17 fathoms, and ſhe will certainly come to hard ſandy ſoundings, 14 to 16 F. Now to know whether theſe ſoundings are on the True or Falſe Point, let her continue her courſe, and if it is the Falſe Point, ſhe will carry along much the ſame depth of water, ſoft ground, with ſometimes mixtures of dark ſand and ſhells, for 9 or 10 leagues, and then come upon the hard ſand ſoundings off Point Palmiras: but upon a NE. courſe, the water deepens 2 or 3 fathoms, perhaps 4 or 5, upon being paſt Point Palmiras; and if ſo, ſhe ought inſtantly to haul up NNW. and NWbN. for Balaſore Road; the water will then ſhoal very gradually, and ſhe will come into ſoft ground, with various mixtures of ſand, ſmall ſhells (moſtly broken) gravel, and dark-coloured rotten ſtones, that may be eaſily crumbled to pieces.

From all this it plainly appears, that though ſailing along ſhore in ſight of the high lands and Pagodas, is the moſt ſatisfactory, as well as the ſhorteſt way; yet no ſhip has reaſon to anchor, lie-to, or even ſhorten ſail to ſee either Pagodas or Point Palmiras; becauſe with a moderate attention to her courſe, or depth of water, ſhe may ſail ſafely to Balaſore, without ſeeing any of them: ſhe need not be directed by the precarious colour of the ground, but by ½ to 5 fathoms increaſed depth of water, which no man can well miſtake; and it is certainly what all ſhips will find, after coming upon the hard ſand off Point Palmiras, even by ſteering NE¼N. or NEbN. No matter whether they ſtrike firſt the hard ſand in 14 or 18 fathoms; nor let any think the depths here mentioned are too near the ſhore, they are far from it; no miſchief can ever happen by keeping in the track; but many ſhips have ſuffered by keeping too far off.

Ships that go from Madraſs to Bengal in September, generally ſail with a fair wind, but ſhould ſail more Eaſterly than in the preceding months; and the later in this month they leave Madraſs, the wider range they ought to take to the Eaſtward: for example, admit Point Palmiras to bear NE¼N. from Madraſs, and a ſhip ſails from Madraſs between the 1ſt and middle of September; her beſt way will be, with a fair wind, to ſhape her courſe ſo as to keep Point Palmiras 2 points on her larboard bow, for ſome days; that is, ſteer from Madraſs Road ENE. 193 miles, which will bring the point to bear NEbN. then to ſteer NEbE. 164 miles, and the point will then bear NNE. then ſteer NE. about 116 miles, and the point will bear about NbE. then ſteer NEbN. 78 miles, and the point will then bear N. then ſteer NNE. 50 miles, and the point will bear about NbW. near 100 miles diſtance; the neareſt part of Orixa will be alſo 70 or 80 miles off: from this, if the wind blows briſk from SW. ſhe ought to ſteer NbE. and N. 'till ſhe brings Point Palmiras to bear about WNW. or WbN.; ſhe will then have Balaſore Bay open, and perhaps ſoundings, ſo may boldly ſteer in NW. for the road: but if, when the point bears NbW. 100 miles off, the winds are light and variable, ſhe had better keep on NNE. and NbE. 'till in about the latitude of Point Palmiras, and then haul up NW. for the road. This range will exceed the direct diſtance above 40 miles, yet, by avoiding the current along the Coaſt of Orixa and Galconda, will greatly ſhorten the paſſage; for although ſome ſhips, with a ſtrong gale, have run it along ſhore at this ſeaſon, others have failed in the attempt, and, beſides prolonging their paſſage, have ſuffered great inconveniences.

Former part of September.

The French ſhip Union, (from Buſſorah) left Madraſs, bound to Bengal, September $\frac{2}{11}$, 1738, and with a freſh gale from SW. ſteered, as is uſually done, in the month of June, and reached Balaſore Road in 5 daysand a half.

Three days after the Union ſailed, (viz. September $\frac{5}{13}$, 1738, the Expedition, captain Sutcliffe (alſo from Buſſorah) left Madraſs, bound to Bengal, and with a freſh gale from SW. ſailed as the Union did, and got very near Jackernaut Pagoda in 4 days: here it fell calm, and a ſtrong current running to the SW. captain Sutcliffe, (who was an experienced ſeaman) declared, that the freſh SW. winds had deceived him, and that he muſt, at any rate,

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get off ſhore. He was however obliged often to anchor in deep water, and the wind being faint, chiefly from E. and ESE. his ſhip was driven almoſt as far Southward as Vizaga atam, before it could be done. Being got off ſhore at laſt, ſhe loſt the current, and ranged to the NEward, as above directed. She reached Baſalore in 1 month from Madraſs; ſo that ſhe was 26 days in getting leſs than 50 leagues.

The ſame day that captain Sutcliffe left Madraſs, the Gamberoon Merchant, captain Riccards, arrived there from Bengal (having worked up along ſhore, in Auguſt, by the help of the current, againſt the wind; which is commonly called the Auguſt Paſſage). She was laden with rice, &c. which ſhe delivered, and inſtead of ballaſt took in a load of ſalt, and ſailed again for Bengal September $\frac{17}{28}$, which was 12 days after the Expedition; and though ſhe had but indifferent winds, yet by ranging Eaſtward, as is above directed, ſhe got into Baſalore Road the ſame day with the Expedition.

Latter part of September. If a ſhip ſails after the middle of September, it is beſt to keep Point Palmiras about 3 points on the larboard bow, for ſome time; therefore let her ſteer from Madraſs Road as follows, viz. EbN. about 153 miles, ENE. 141 miles, NEbE. 116 miles, NE. 90 miles, NEbN. 179 miles, and then N. 'till ſhe has ſoundings in 40 to 50 fathoms, which ought to be about 100 miles EbN. or E$\frac{1}{2}$N. from Point Palmiras: ſo much as ſhe is leſs, ſhe has been ſet to the Weſtward by the currents. If ſhe ſails about the end of September or earlier, but meets light variable winds, it is proper to take a wider range; and therefore ſhe ought to ſail from Madraſs, as follows, viz. EbN. 153 miles, ENE. 258 miles, NEbE. 187 miles, NNE. 204 miles, and then N. 'till ſhe gets ſoundings in about 40 to 50 fathoms, which ought to be about 180 miles EbN. or ENE. from Point Palmiras; but ſhips generally find themſelves to the Weſtward of this account: ſhe muſt then coaſt along Weſtward to Baſalore. See the directions for next month; and the New Directory, pages 46 and 47.

By theſe ranges it is not intended to give each exact courſe and diſtance that a ſhip ought to make, (the variable winds render exactneſs impracticable), but only to point out the beſt tracks, by following of which, (if the winds permit) ſhe will commonly make a ſpeedier paſſage than by any other method: let it however be obſerved, that late ſhips, meeting frequent light variable winds, ought rather to range more Eaſterly than is here preſcribed; as, on the contrary, ſhips being got near the latitude of Point Palmiras with briſk Southerly winds, inſtead of ſteering N. had better haul up NNW. NW. and WNW. as they bring the point to the Southward of Weſt. Many ſhips bound to Bengal, from Madraſs and other neighbouring places, in September, thinking they are far enough to the Eaſtward, fall in with the Coaſt of Orixa: this ariſes from their going too far Northward before they get ſufficient Eaſting, whereby they meet with light variable winds and Weſterly currents: let ſuch ſtrike off ſhore immediately untill they get into the track above mentioned, and follow it: the reaſon of all which will appear clearer from the following inſtances:

The Heathcote Indiaman, and Fanny country ſhip, bound to Bengal, ſailed in company from Madraſs, September $\frac{13}{24}$, 1740; but not keeping enough to the Eaſtward, they fell in with the land off Pondy or Barva: the Heathcote immediately put off ſhore, and by taking a range Eaſtward, got to Bengal about October $\frac{13}{24}$; but the Fanny, attempting to get her paſſage along the coaſt, met nothing but light winds, calms, and ſtrong currents to the SW. 'till November, when the monſoon began with a freſh gale from NNE. and NE. with which ſhe was glad, at laſt, to croud under her courſes, and take a range Eaſtward; by which means ſhe reached Bengal late in December, after being obliged to kill 6 or 8 Arab horſes for want of water.

Six days after the Heathcote and Fanny left Madraſs, viz. September $\frac{19}{30}$, 1740, the William and Mary ſnow ſailed from Madraſs for Bengal; and by ſailing Eaſtward, as is above directed, got to Calcutta in 25 days; and, what is remarkable, it appeared afterwards, by com

comparing journals, that at the very time the Fanny was becalmed, in ſhore, between the latitudes 18° and 19°, the ſnow in the ſame latitude had a briſk gale at WSW. This wind, however, gradually decreaſed 'till ſhe got into the latitude 21°, where ſhe had ſoundings 70 fathoms, and was above 50 leagues Eaſtward of Balaſore. As the breezes were very faint, ſhe was deſirous of getting into anchoring ground, and for that purpoſe ſteered right in ſhore (North) when it fell calm, and continued ſo for a week, during which time ſhe drove with the tide and current up to Balaſore Road. To underſtand how that was done, it muſt be obſerved, that from Balaſore, as far as 60 or 70 leagues Eaſtward, and as high up the River Hughley as Ingellee, the firſt part of the ebb tide runs E. then ESE. SE. and SSE. S. SSW. SW. and WSW. when the ebb is done; and the flood tide begins to run on the oppoſite points, viz. W. WNW. NW. NNW. N. NNE. NE. and ENE.: the flood is then done, and the ebb begins again to run Eaſt; but at this ſeaſon of the year, the freſhes from the river cauſe much ſtronger ebb tides or currents to the WSW. and SW. than the flood tide in the oppoſite points. The ebb tide, for the ſame reaſon, runs much longer: the ſnow, therefore, uſually continued to anchor in 9 or 10 fathoms water, when the flood tide began to ſet to the Eaſtward of North: ſhe lay at anchor during the laſt part of the flood, and firſt of the ebb tide, but got under weigh as ſoon as the ebb tide got to the Weſtward of South, and drove out SSW. SW. and WSW. ſo that when the flood began to ſet W. ſhe was perhaps in 20 to 23 fathoms, and from thence continued driving WNW. NW. NNW. and N. 'till in 8, 9, or 10 fathoms, where ſhe again anchored.

A ſhip that ſails in October, ought to take ſtill a wider range than in September: let ſuch, therefore, if the winds permit, ſteer from Madraſs Road E. 2°½, EbN. 3°, ENE. 3°½, NEbE. 3°, and then NE. 'till they ſee the Coaſt of Arracan: but as the SW. monſoon is now almoſt done, and that from the NE. commences, the winds will ſeldom or never permit ſuch a track to be followed; however ſhe ought to be careful not to go within it, except when, near the Arracan Coaſt, ſhe has ſtrong SW. winds; and then her buſineſs will be to avoid that ſhore, and ſteer NNE. N. and NNW. 'till in ſoundings, and then along ſhore to Balaſore Road. If ſhe has light variable winds, ſhe ought rather to take a wider range than is preſcribed, particularly with NE. winds ſhe ought not ('till far Eaſtward) to ſteer to the NNW. for that will certainly loſe her paſſage; but rather EbS. ESE. and SEbE. by which perhaps ſhe may loſe 1°, 2°, or 3°, of latitude; but then ſhe will get Eaſting, which is now chiefly wanted; for when ſhe has got well to the Eaſtward, ſhe is always ſure of winds to carry her N. NbW. and NNW. Some people judge it abſolutely neceſſary to ſee the Coaſt of Arracan, but it really is not: however, late ſhips had better ſee it; becauſe that, in ſome meaſure, ſecures the paſſage: to ſhew all which the more clearly, the following examples are ſet forth, choſe purpoſely from thoſe performed in 1748; becauſe during the months of October and November, that year, there were leſs NW. and more ſteady NE. winds, than had been known for many years. *October.*

The Bombay-Caſtle Indiaman, captain Brown, bound to Bengal, left Pondicherry Road, October $\frac{2}{13}$, 1748, and with light breezes from SE. to SW. and WSW. was, the 6th at noon, in latitude 13 06′ N. meridian diſtance 3° 31′ E. The 4 next days ſhe had light variable winds and much calms, ſo that, the 10th at noon, her latitude obſerved was 13° 14′. N. meridian diſtance 4° 49′ E. Here moderate and other faint Northerly winds began, and continued between the N. and E. with ſcarce any intermiſſion all the paſſage: with theſe winds ſhe ſtood, cloſe hauled, commonly ESE. and EbN. and ſometimes tacked and ſtood NbE. to NNW. to the 24th, at noon, when her latitude obſerved was 12° 54′ N. meridian diſtance from Pondicherry 13° 32′ E. Half an hour afterwards, ſhe ſaw the Great Andamans from SE½E. to ENE½E. 10 or 12 leagues off. At ſun-ſet they were 4 leagues off ſhore, in 46 fathoms, fine ſandy ground: ſent their boat in ſhore to ſound, which found

even ſoundings to within a mile of the ſhore, where was 20 fathoms. She continued working to the NNW. and Eaſtward, as the wind permitted; and October 29, at ſun-ſet, the North end of the Andamans bore from SWbS. to SSE½E. diſtance about 5 leagues.

The Fanny, captain Rannie, ſailed from Coodalure to Bengal, October $\frac{7}{17}$, 1748, and with winds from the NE. quarter, ſteered, cloſe hauled, between EbN. and NEbE. 'till ſhe had made, by her reckoning, 11° meridian diſtance E. and was in the latitude of 9° N.: ſhe then tacked, and ſtood between NbE. and NbW. (as the wind would permit) 'till in the latitude of 18', meridian diſtance 10°E. That day ſhe was, by obſervation, 20 miles S°ward of account, which cauſed a ſuſpicion of drawing too near the Coaſt of Orixa. She tacked, and ſtood over between EbN. and SEbE. 'till ſhe made her meridian diſtance 16° 30′ E. and was, by obſervation, in the latitude 17° N. Several appearances of ſmall birds, &c. made them judge the Arracan ſhore to be near, but they did not ſee it; and the wind coming to EbN. ſhe tacked and ſtood, cloſe hauled, NbE. to NNW. which carried her to Balaſore, having juſt weathered Point Palmiras in 18 fathoms water; and made 13° meridian diſtance from Coodalure, during a paſſage of 6 weeks.

The day after the Fanny left Coodalure, viz. October $\frac{6}{17}$, 1748, the Lapwing Indiaman and Succeſs galley (both bound to Bengal) ſailed from Pondicherry, and with the ſame wind as the Fanny had, from the NE. quarter. They ſtood, cloſe hauled, between EbN. and SEbE. 'till they were to the Eaſtward of the Niccabar Iſlands, and then tacked and ſtood Northward, paſſed the Cocos, coaſted the Arracan Coaſt, took in ſome water at the Iſland Cudeba or Cubeb, and croſſed over to Balaſore, which they reached after a paſſage of 6 weeks.

This was the route they took; but as they ſailed much faſter than the Fanny (nay perhaps better than moſt ſhips in the world) it is probable they would have got their paſſage 8 or 10 days ſooner, if they had followed the route taken by the Fanny; for ſhe ſufficiently avoided the current that runs along the Coaſt of Orixa, without taking ſo wide a range; however, the range taken by the Succeſs and Lapwing makes the paſſage the more ſecure.

From China and other Eaſtern parts to Bengal.

December. "Ships coming from China to Bengal in December, by keeping cloſe to Junkceylon Head, and from thence ſtanding Northward, cloſe hauled, commonly weather the Andaman, and ſometimes the Cocos Iſlands; but they never make it their buſineſs to ſee either the Negrais or Coaſt of Arracan: they afterwards ſtand on towards the bottom of the bay; but when the wind comes too far Northward, they tack and run to the Eaſtward; and when it veers Eaſtward, they ſteer again to the Northward.

The channel Eaſtward of the Andamans is fair and good; nor is there any thing under water to hurt a ſhip, except they go very near the ſhore indeed. Norcandum is a high ſteep iſland, which may be ſeen 14 leagues off, and hath deep water all round it. The ſmall iſland laid down to the Southward of Norcandum, in the Engliſh Pilot Book, and about EbN. from the Niccabars, doth not exiſt. And Monday, by ſome called High Iſland, near the Great Andaman, is very high, and has no ground 100 fathoms, 2 leagues off it. The North end of the Andamans is a fair pretty high ſhore, and good ſoundings along it. Captain Barton, one voyage, juſt weathered the NE. point of it, in 8 fathoms; but that was too near, for he was not ½ a mile from the ſtrand. The Cocos Iſlands are pretty high, and have many trees; but the Preparis are lower, and more barren. There are regular ſoundings round theſe cluſters of iſlands. The channel between the Andamans and Cocos, as that between the Cocos and Preparis, is very fair and good; the water alſo is deep."

Many ſhips, after reaching the Coaſt of Arracan, have been much at a loſs in croſſing over to Balaſore, ſome having judged themſelves at the Braces, when they were ſcarce

half way: ſome, too much afraid of the ſands, have run paſt Point Palmiras; while others, too little afraid of them, or not conſidering how the Coaſt lies, have got ſuddenly into the ſhoal water: others again have been obliged to ride a hard gale, at anchor, in the open ſea; and ſome have loſt a month in working up this coaſt, when they had no occaſion to loſe an hour.

The Heſter Indiaman ſailed from Bencoolen September $\frac{4}{15}$, 1705, bound to Bengal. She worked along the Arracan Coaſt, and had the laſt ſight of it October $\frac{6}{17}$, being pretty high land, bearing NE. about 10 leagues off: her latitude, by account, 20° 40′ N. Twelve days afterwards, getting ſuddenly from 6 to 5 fathoms, they thought themſelves at the foot of the Braces, and anchored in 5 fathoms ouze and ſand; latitude obſerved 21° 21′ N. meridian diſtance from the Arracan Coaſt 3° 25′ W.: at the ſame time ſaw land from N. to NW. about 6 leagues off. From thence the gunner was ſent aſhore, in the pinnace, to enquire where they were; he returned the $\frac{20}{31}$, with an account that all was low drowned land, deſtitute of inhabitants: at the ſame time they met a company's ſloop going to Chatigan, who told them their error, and that they were 100 miles Eaſtward of Sagor: they then made the beſt of their way to the Weſtward, and reached Balaſore Oct. 24, (Nov. 4, NS.) having made 5½° meridian diſtance, (including allowance for currents, according to their beſt judgement) from the Arracan Coaſt to 6½ fathoms, in ſight of the Bankſhall houſe at Balaſore. Before they ſaw the ſloop, they loſt ſoundings ſometimes. Soon after, by ſteering too Northerly, they got into ſhoal water: ſhe alſo rid at anchor in 18 fathoms water, a whole night and morning, in a hard gale of wind, in latitude 21° 12′ N.

Captain Glen, in a country ſhip, by keeping in 22° to 24° (from Sagor) paſt Point Palmiras, and got into ſhoal water on the Falſe Point, from whence ſhe was 8 days in working round into Balaſore Road: and the Bombay-Caſtle Indiaman already mentioned, p. 29, would have done the ſame; for without the Point, in 23 fathoms, ſhe was ſteering WNW. with the wind at NE. and NEbN. but luckily in the morning ſaw a country ſhip cloſe hauled; ſhe did the ſame, and upon a NWbN. and NNW½W. courſe, juſt weathered Point Palmiras, in 17 fathoms water.

November 17, 1759, the Prince George Indiaman, bound to Bengal, was, January 8, at noon, in latitude 21° 12′ N. per obſervation, 1° 57′ W. meridian diſtance from the Broken Iſlands of Arracan, depth 20 fathoms. From this point with the wind at NE. ſhe run (the 9th) 35 miles WNW. and had very even ſoundings, gradually ſhoaling to 12 fathoms, by 10 PM. The next hour, ſhe ſteered the ſame courſe 4 miles, and deepening her water quick to 15, 17, 23 fathoms, at 11 PM. hauled up NW. but in ½ an hour (running 1½ mile) had 35 to 40 fathoms, then no ground at 90 fathoms; upon which they wore to the Eaſtward, but immediately having ground again 100 fathoms, wore and ſtood WbN. to WbS. 8 miles, and had ſoundings from 100 fathoms, to 50, 24, 18, 10, and 5 fathoms, ſtiff clay: wore again and ſteered SE¼S. then had from 5 to 25, and preſently no ground. They continued this courſe 1½ hour, when they hauled gradually round to S. SSW. and WSW. then ſtruck ground 45 fathoms, at 11 AM. The next hour ſhe run 4 miles WbN. and had 36 fathoms, latitude obſerved 21° 05′ N. meridian diſtance 3° 02′ W. from Arracan Iſlands. Having a freſh gale at NE. ſhe run next day W. 28 miles, and was then in 15 fathoms. At 8 PM. ſteered WbN. 7½ miles; depth 14½, 13, 15. At 9 PM. ſteered then WNW. 16 miles; 15 to 16 fathoms; but by lying-to, to ſpeak to a ſloop, ſhe deepened to 22 fathoms. Hauled up NWbW. 3½ miles, and had the ſame depths; therefore hauled NW. 2 miles, and had 50 fathoms; then NWbN. 5 miles, and had 17, 16, 14 fathoms. Edged away NW. 5 miles, and had 14, 13½, 12, 12 fathoms; then NWbW. 5 miles, and had ſoundings, ½11, 11, ½10, and 10 fathoms. It was then 8 AM. and ſhe ſaw the pilot ſloops bearing SWbS.

CHAP.

CHAP. IV.

Some Remarks relating to the Coaſts, Sands, &c. in the Bottom of the Bay of Bengal, *and further Directions for the Navigation of thoſe Parts.*

FROM the Negrais to the Arracan River, the coaſt ſtretches about N. and NbW.; that from the Broken Iſlands of Arracan to Sundiva, to the Sagor Sand, the Coaſt lies WbS. and WSW.; but when paſt Sagor Sand, the coaſt, to where the pilot ſloops lie from October to January, ſtretches WbN. and WNW.

The diſtance from Point Palmiras to the mouth of Arracan River is about 100 leagues; and the whole bottom of Bengal Bay from Sagor to Sundiva Iſland, is low ſwampy ground, covered with buſhes, interſected with many creeks, and ſeveral unknown mouths, by which the River Ganges diſcharges itſelf into the bay, which divides the land into numberleſs iſlands, uninhabited, except by wild beaſts; and in ſome places a few poor people, that in the dry ſeaſon come there to fiſh and make ſalt.

From Sundiva, Southward, to within 10 or 15 leagues of Arracan River, there are ſome unknown dangerous ſands, that lie a good diſtance from the ſhore; and though the ſhore from thence to the Negrais is bold, yet there are ſome rocks, in deepiſh water, that ought and muſt be avoided. Old captain Hamilton tells of one near the Negrais, about latitude 16° 30′ N. a league off ſhore. The journal of the above-mentioned Heſter Indiaman aſſerts ſeeing breakers on a reef of rocks, 2 miles without them, when they lay at anchor, 4 leagues off ſhore, in about the latitude of 17° 20′ N. but it is thought they have either miſtaken their diſtance off ſhore, or taken ſome ripling for breakers; becauſe no rocks were ever ſeen by others, ſo far off ſhore, in that latitude.

Within the Iſland Cubeb, there is a fair and good paſſage for any ſhip to paſs: freſh water is alſo to be had there (looking well after the natives); and both that iſland, and the iſlands off the mouth of Arracan River, yield good ſhelter to ſhips in bad weather. The hard ſand, off Point Palmiras, is in ſome places of a light, and others of a dark brown colour, with ſhells and ſtones, and ſtretches into 20 or 22 fathoms water; but the Braces, Sea-reef, Sagor, &c. ſands, Eaſtward to Sundiva, are (all that are yet known) dark coloured, blackiſh ſand, ſometimes a ſhining black; nor does any of them reach into above 12 or 13 fathoms water, all without that being ſoft ground. From the ſea reef to the ſand off Point Palmiras the ground (in 20 to 23 fathoms) though ſoft, is commonly mixed with dark, blackiſh ſand, and broken ſhells; but in the channel, between the Braces, and between all the other ſands, Eaſtward to Sundiva, the ground is ouze, except on the edge of the ſand, where it will be found dark ſand and ouze. One thing more muſt not be omitted, that is, about half way between the Arracan Iſlands and Sagor Sand, the main part of the great River Ganges empties itſelf into the ſea, between two banks, in a channel of about 6 or 7 miles, and too deep for our common hand-lines to meaſure: for want of knowing this, many ſhips have been in great perplexity.

Upon the whole, all ſhips working upon the Arracan Coaſt ought to keep ſome anchors clear, a good look-out, and the lead going. If they are in want of water, or in bad weather, they may go under or within the iſlands Cubeb (or Cudeba) or within Bolongo, &c. Iſlands, in the mouth of Arracan River (where the channel is deep and good) as the wind and their ſituation require. But ſhips, upon this coaſt, bound to Bengal between the middle of October and the middle of December, if they want no water, and the weather is tole-

tolerable, had beſt keep along ſhore at 8 or 9 leagues diſtance, which will keep them within 25 F. water, untill they get as high as the Arracan Iſlands, in latitude from 19° 13′ to 20° N. and then edge off NW. or rather NWbW: they will deepen their water, and perhaps (though ſeldom) loſe ſoundings; however, by ſailing 20 or 30 leagues, will come again into ſoundings: let them keep on to the NW. 'till they get into 18 or 20 fathoms, and then keep along WbS. and WSW. which will carry them in much the ſame depth, 'till they reach the above-mentioned deep channel of the Ganges, about 2° Weſtward of Arracan River, in latitude 21° or 21° 20′ N. and then, perhaps, the water will ſuddenly deepen to 30, 40, or 50 fathoms, and then no ground; which they ought not to regard, but keep on WbS. and in ſailing 6 or 7 miles further, they will again have much the ſame depth, viz. 18 or 20 fathoms, in which let them keep, upon a WbS. and WSW. courſe, 'till they find that courſe deepens the water; they may then reſt aſſured they are paſt Sagor Sand, and ſhould immediately haul up to the NW. or NWbN. untill they get into 13 fathoms: let them then ſteer WNW. and WbN. and that will lead them right into the track, where the pilot ſloops lie, in 9 fathoms water; to which depth they will come by a very ſlow gradual decreaſe, from 13 fathoms, and all ſoft ground, though ſometimes mixed with ſand, ſhells, and rotten ſtones, that will eaſily crumble. Theſe are the beſt tracks for ſhips bound to Bengal, at this ſeaſon, ſuppoſing the wind favourable; but as that is not often the caſe, let it be obſerved, that ſhips bound this way ought not, at any ſeaſon of the year, to keep too near the Arracan ſhore; becauſe, with NW. winds, they will be obliged to anchor if in ſhore; whereas, with 8 or 10 leagues offing, they can make a good ſtretch to the NNE: this is however more eſpecially wrong in October, or late in December; becauſe, in October, there are often Southerly winds in the bay; beſides, if the coaſt is once ſeen, it can always be reached again; becauſe there is no current ſetting from it; and late in December, the current is quite done all over the bottom of the bay; ſo that, if a ſhip ſhould fall to leeward of Point Palmiras, ſhe can eaſily work round to Balaſore, provided ſhe keeps cloſe to the ſhore, and makes uſe of the tides.

The courſes above mentioned, along the bottom of the bay, are to be underſtood as true courſes. Ships ought to be careful in obſerving the ſet of the currents, ſo as to ſhape a true courſe; for ſuppoſe it is wanted to ſteer along ſhore WbS. if the current runs ſtrong to the SW. or SWbW. it will require to ſteer W. or WbN. by the compaſs, to make a WbS. courſe good: the depth of water will adjuſt this ſometimes; but it is beſt done by anchoring; or if that is inconvenient, the true ſet of the currents can be nearly aſcertained by obſerving how the lead-line grows from the ſhip, after veering out a good deal of line. The deep channel above mentioned is not met with by every ſhip; ſome paſſing ſwiftly over it, and neglecting the lead; others get not into ſoundings 'till they are to the Weſtward of it. Ships running in ſhore, between the Falſe Point and Point Palmiras, have ſoft ground 'till they come into 8 fathoms water; where the ground is hard and dark ſand, like that of the Braces, and the Eaſtern ſands.

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Lunettes d'Approche de la même Conſtruction, courtes et commodes pour la Poche; Lorgnettes pour le Spectacle; Verres concaves pour les Perſonnes qui ont la Vuë courte; Verres à lire, à bruler, et à groſſir les Objets.

Teleſcopes *Neutoniens & Grégoriens*.

Microſcopes doubles, ſimples, aquatiques et opaques.

Microſcopes Solaires qui font paroitre l'Objet plus brilliant et plus clair, et le Champ beaucoup plus large.

Priſmes pour démontrer la Theorie de la Lumiere et des Couleurs, Miroirs convexes & concaves, Chambres obſcures propres à deſſiner les Païſages, Lanternes magiques, Miroirs cylindriques et Tableaux cylindriques.

Octants de *Hadley* diviſés de maniere la plus exacte avec des Verres dont les Surfaces ſont exactement paralléles & plates. Des Sextants auſſi de la même Conſtruction, auxquels on applique des Lunettes et d'autres Apparatus pour determiner la Longitude en Mer.

Azimuth et toutes Sortes d'autres Bouſſoles, Theodolites, les Tables planes, Lunettes a niveaux, Roues pour meſurer les Diſtances, et Pantographes.

Cadrans Solaires de toutes eſpeces, Etuis d'Inſtrumens Mathematiques à Deſſein, Regles Paralléles, et Compas de Reduction.

Barometres, Thermometres, Hygrometres, Ballances Hydroſtatiques et Hydrometres.

Pompes Pneumatiques de toutes Eſpeces, avec les Appareils, Machines Electriques, et toutes Sortes d'Inſtrumens Optiques, Mathematiques, et Philoſophiques, de la derniere et meilleure Invention.

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De plus, les Cartes, &c. ſuivantes ſont imprimées pour le dit HENRY GREGORY; *à ſavoir*,

LE NOUVEAU DIRECTOIRE pour les Indes Orientales, accompagné de Cartes générales & particulières pour la Navigation de ces Mers; avec des Additions, Corrections, & Notes Expliquatoires. Par le Sieur HERBERT.

Un Nombre de REMARQUES & OBSERVATIONS faites pendant un Voyage aux Indes Orientales, avec le Navire du Roi, l'Elizabeth, depuis le Commencement de l'Année 1758, juſqu'à la Fin de l'Année 1764; avec les Inſtructions neceſſaires pour le Voyage & le Retour, & pour la Connoiſſance des Ports & des Rades de ces Parages: Le tout pour ſervir de Supplement au Nouveau Directoire pour les Indes Orientales. Par Guillaume Nichelſon, Commandant du dit Navire.

Avec les Plans ſuivants:

Carte du Port de Bombay, ſur huit Feuilles de Papier Imperial.

Carte de la Grande Rade de la Manille, ſur quatre Feuilles de Papier d'Elephant.

Carte de la Rade de Mathurin, du Coté de Nord de l'Iſle Diego Rayes, ſur quatre Feuilles de Papier Sur-royal.

Carte de la grande Rade & Havre de Trincomalay, ſur quatre Feuilles de Papier Royal.

Grande Carte de la Rade de St. Auguſtin, à l'Iſle de Madagaſcar.

Grande Carte de Faux Rade, et de la Rade de Simon.

Plan de la Rade du Coté de Sud-Oueſt de l'Iſle Timoan.

Plan de la Rade du Coté de Sud-Oueſt de l'Iſle Pulo Auore.

Ces huit Cartes etoient deſſinées par Mr. Nichelſon, & ſe vendent ou en Feuilles, ou colées ſur Drap.

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